

ARLINGTON PUBLIC SCHOOLS

In accordance with the provisions of the Massachusetts General laws, Chapter 30A, Section 20, notice is hereby given for the following meeting of the:

***Arlington School Committee
School Committee Regular Meeting
Thursday, September 28, 2017
6:30 PM***

*Arlington High School
School Committee Room
869 Mass Avenue, 6th Floor
Arlington, MA 02476*

6:30 PM Open Meeting

6:35 PM Human Rights Commission Appointment

- *Vote to Appoint Dondria Maxwell*

6:45 PM Update on Facilities Department Operations R. Bennett

7:10 PM Public Participation

7:20 PM OECD Test Update, M. Janger and P. McKnight

7:40 PM Youth Risk Behavior Survey and Social and Emotional Report, C. Bouvier, I. LaPlant

8:00 PM Report on the Progress on FY 17 Goals, K. Bodie

Superintendent's Evaluation Process, J. Thielman

8:20 PM Superintendent's Report K. Bodie

- *School Building Projects Update*

8:40 PM Consent Agenda

All items listed with an asterisk are considered to be routine and will be enacted by one motion. There will be no separate discussion of these items unless a member of the committee so requests, in which event the item will be considered in its normal sequence:

Approval of Minutes: School Committee Regular Meeting September 14, 2017

Approval of Warrant: Warrant # 18054 Total Amount \$627,226.94 dated September 14, 2017

8:45 PM Vote Delegate and Resolutions for MASC Annual Business Meeting

- *Vote Delegate and Resolutions for the MASC Annual Business Meeting held during the Joint Conference on Wednesday, November 1, 2017, 3:15 pm*

Policy to review: None

8:50 PM Subcommittee & Liaison Reports & Announcements

- *Budget, Kirsi Allison-Ampe, MD. (Chair)*
- *Community Relations, Cindy Starks, (Chair)*
 - *School Committee Chat Schedule*
- *District Accountability, Curriculum/Instruction & Assessment, (CIAA) Paul Schlichtman, (Chair)*
- *Facilities, Jennifer Susse (Chair)*
- *Policies & Procedures, Len Kardon (Chair)*
- *School Enrollment Task Force, Bill Hayner, Cindy Starks, Jennifer Susse*
- *Legal Services Review, Bill Hayner, Len Kardon*
- *Arlington High School Building Committee Jeff Thielman and Kirsi Allison-Ampe*
- *Gibbs Committee, Cindy Starks*
- *Warrant Committee, Bill Hayner*
- *Liaisons Reports*
- *Announcements*
- *Future Agenda Items*

Executive Session

- *To conduct strategy sessions in preparation for negotiations with union and/or nonunion personnel or contract negotiations with union and /or nonunion in which if held in an a open meeting may have a detrimental effect.*
- *To conduct strategy with respect to collective bargaining or litigation, in which if held in an open meeting may have a detrimental effect, Collective bargaining may also be conducted.*

9:00 PM Adjournment

The listings of matters are those reasonably anticipated by the Chair, which may be discussed at the meeting. Not all items listed may in fact be discussed and other items not listed may also be brought up for discussion to the extent permitted by law.

Stated times and time amounts, listed in parenthesis, are the estimated amount of time for that particular agenda item. Actual times may be shorter or longer depending on the time needed to fully explore the topic.

Submitted by Jeff Thielman, Chair

Correspondence Received:

MASC Annual Business Meeting Form and Resolutions

Draft minutes from School Committee Regular and Executive Session meeting 9/14/2017.

Warrant # 18054 dated 9/14/2017

Facilities Presentation, R. Bennett

EDCO Board of Directors letter, September 15, 2017

The NY Times The Economic Case for Letting Teenagers Sleep a Little Later, J. Susse
YRBS Highlights Report and 2017 Youth Risk Survey
Behavior Survey Report September 2017 and presentation
Email Correspondence Received by K. Roche
Community Relations Minutes approved minutes 8/30/2017
Email correspondence K. Nickerson
Resume of AHRC Candidate, D. Maxwell
CBI Evaluation of the Superintendent Policy
Superintendent Evaluation Process Timeline
School Committee chat schedule
AHS Presentation PISA



Town of Arlington, Massachusetts

6:35 PM Human Rights Commission Appointment

Summary:

- Vote to Appoint Dondria Maxwell

ATTACHMENTS:

Type	File Name	Description
Backup Material	DMaxwell_Sr_Proj_Mgr_Resume__Recommend_9_28_2017.docx	AHRC candidate recommendation

D'ondria Maxwell

Sharp Project Manager/Systems Analyst with proven ability to operate across diverse functional groups, identify critical needs, and effectively implement solutions that produce tangible results.

Professional Experience

June 2015 – Present

Bowdoin Technology Partners

Waltham, MA

Senior Project Manager – Learning Management Systems, Life Sciences TESARO

- Plan and manage the implementation of cloud-based learning and business applications.
- Implemented TESARO's first Learning Management Solution (LMS) used to train employees on corporate policies and healthcare regulations.
- Managed the transition of applicant tracking and hiring from an outsourced solution to an internally managed cloud based solution with new job application creation and review processes.
- Leading the contracts management system implementation.
- Work with senior management to identify and prioritize product and business requirements.
- Communicate with project teams to ensure requirements are understood and implemented as planned.
- Promote user adoption by creating company communications and training materials.
- Create and maintain implementation timelines.
- Produce documentation per Information Solution Life Cycle as set forth by the TESARO Information Technology including project plans, requirements documents, configuration specifications, acceptance testing, and project summary documents.
- Facilitate project meetings with stakeholders to communicate progress and build consensus.
- Provide assistance and support to content/course developers and end users.
- Establish and manage processes for LMS user provisioning and course assignments.
- Provide monthly reports on training compliance.
- Manage vendor relationships.

July 2012 – May 2015

Harvard Business School

Cambridge, MA

Senior Technical Project Manager

- Project manager for Executive Education technology projects from inception to delivery.
- Managed the transition to a new learning management system (LMS), ongoing LMS enhancements, and the program delivery portion of the Student Information System implementation.
- Worked with Executive Education stakeholders to identify and prioritize requirements.
- Coordinated efforts between Executive Education, outside vendors and internal IT development groups to ensure proper implementation of the requirements and establish deployment timelines.
- Defined and managed the work of program technology analysts and Year-UP interns completing project tasks including requirements verification, documentation, training and user support.
- Participated in daily and weekly meetings with development, facilitated weekly meetings with stakeholders and provided updates in monthly steering committee meetings.
- Introduced and established user acceptance practices for Executive Education projects.
- Prepared launch plans and materials for user acceptance testing and end user training.
- Collaborated with HBS Marketing and Communications on updates shared with the HBS community.
- Participant in HBS's Leading with Excellence Program 2014/2015.

October 2011 – June 2012

Harvard University

Cambridge, MA

Senior Project Manager

- Planned and managed the implementation of applications and data exports that extended the capabilities of the StarRez student housing application used by the Office of Student Life.
- Collaborated with deans in the Office of Student Life and Academic Advising, as well as the Freshman Deans Office gathering project requirements.
- Developed implementation timelines including testing, release of new functionality and upgrades.
- Documented business and support process changes as new features were deployed.
- Collaborated with Harvard University IT on project planning, system implementation and issue resolution.
- Led requirements gathering for a new student organization information management system.
- Managed vendor selection process for the SOIMS including creating the RFP, coordinating vendor visits, and providing input on proposals and contracts.

July 2010 – Present

Inspired Logic Consulting

Arlington, MA

Principle Consultant/Founder

- Assist non-profit organizations with organizational and operational development.
- Assessed the state of key instructional and support technology implementations for Edward Waters College in Jacksonville, FL. Provided recommendations for improvements. Proposed strategies for achieving future technology goals.

October 2005 – January 2010

Boston College

Chestnut Hill, MA

Project Manager/Course Management Administrator

- Planned the Blackboard implementation and managed the migration from WebCT.
- Created timelines and supporting processes. Presented project plans to university administrators, faculty and staff. Provided monthly reports on system usage and project status.
- Led training sessions and consulted with faculty and staff transitioning to the new system.
- Resolved user issues reported by email and through the departmental issue tracking system.
- Managed Instructional Designers, Instructional Technologists and student workers supporting the migration and providing consulting services to faculty and students.
- Kept abreast of online learning technologies by attending Blackboard User Group, NERCOMP, EdTech talks and training sessions.
- Acted as a liaison between faculty, information technology services and application vendors to ensure that the application features were implemented, properly integrated with the student information system and adequately supported. Integrated additional e-Learning technologies including Wimba, iClicker, Echo360 Course Capture, PodCasting and media streaming.
- Obtained feedback on user adoption through online surveys, luncheons and community forums.
- Created and maintained system documentation including the administrator guide, training materials, system maintenance guides and web page content.
- Completed the University Affiliates management development program.
- Completed Fundamentals of Successful Project Management Training.

November 2001 – September 2002

Verizon

Irving, TX

Technical Project Manager/Lead Business Systems Analyst

- Managed teams creating new web content and application features for Verizon.com.
- Created comprehensive project plans to manage project resources and track team progress.
- Gathered and documented application requirements, created test plans, and tested new features.
- Founding member of ***Rational Users Group***, Dallas, TX.

Business Systems Analyst

- Created process flows representing the eBusiness applications on Verizon.com used by design teams making application changes and enhancements to Verizon.com.
- Developed an Object Oriented Analysis and Design Standard adopted by the entire organization to document requirements, define the system architectures, and design application features.
- Developed software design specifications for new application development.

March 1998 – November 2001

Nokia

Irving, TX

Senior Systems Analyst, Project Lead

- Managed mobile internet application development and integration projects for U.S. wireless carriers.
- Led the technology transfer of wireless applications from the European market.
- Produced requirements documents outlining system details and delivery schedules. Created training materials and delivered training as needed.
- Presented solutions to customers to understand solution viability and generate business opportunities.

Software Design Engineer

- Member of an application development board managing the development of a wireless portal platform.
- Created the development process and technical guidelines for selecting development partners.
- Designed, developed and integrated wireless email components with Nokia's messaging platform for the delivery of messages to mobile phones.

October 1995 – March 1998

IBM

Southlake, TX

Application Developer

- Designed and implemented business objects for a retail industry decision support system.
- Identified system requirements as a participant in Joint Application Design sessions.
- Managed and mentored the summer co-op updating the object models for the project.

Information Technology Specialist

- Planned the integration of an oil refinery management solution for a refinery in Saudi Arabia.
- Implemented the MS Exchange Server mail system for the department.
- Mentored and managed two co-ops.

Internet Applications Developer

Palo Alto, CA

- Designed and developed a content delivery system securely transmitting and receiving articles, wire feeds, and classified ads for the web version of the LA Times.

January 1993 – August 1994

Texas Instruments

Richardson, TX

Software Quality Engineer

- Determined and prioritized software enhancements for a wafer manufacturing tracking system.
- Implemented features for radar mission and acceptance test software.

Technology Skill Summary

ADP WorkForce Now Applicant Tracking, QPharma Python LMS, Salesforce, Desire2Learn LMS, BlackBoard LMS, BrainShark, VIDIZMO, MS Office Suite, MS Visio, MS Project, MS SharePoint, JAVA, C++, Perl

Education

Stanford University | GEM Fellow | MS, Computer Science
 Prairie View A&M University | Benjamin Banneker Honors College | BS, Computer Science



Town of Arlington, Massachusetts

6:45 PM Update on Facilities Department Operations R. Bennett

ATTACHMENTS:

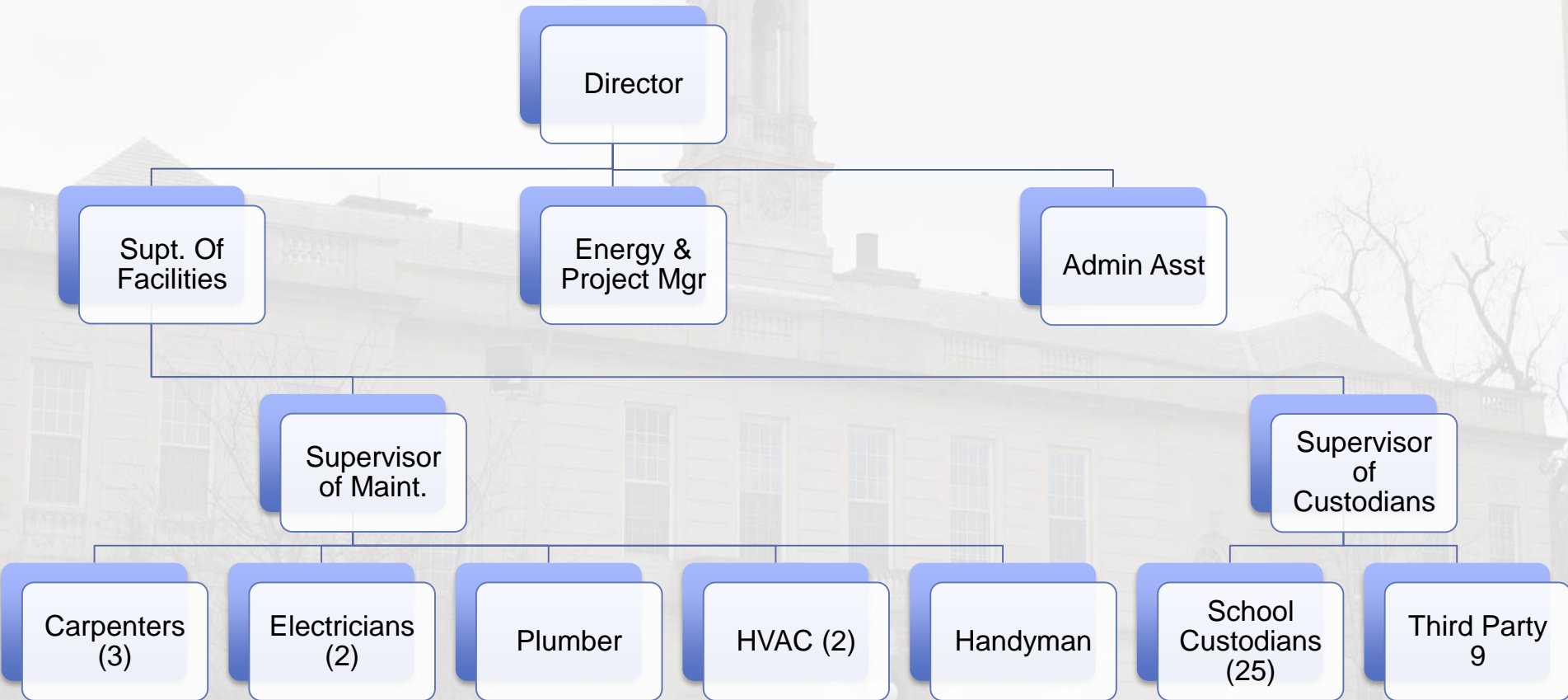
Type	File Name	Description
▣ Presentation	Facilities_Presentaton_9_28_2017.pptx	Facility Presentation



FACILITIES DEPARTMENT

Presentation to
Arlington School Committee
September 28, 2017

STAFFING




SOFTWARE

Three Modules to Encompass all Building Data and Maintenance Needs

- Work Orders
- Preventive Maintenance
- Capital Forecast

SOFTWARE- WORK ORDERS

Search for  [Advanced Search](#) [Services](#) | [Help](#)

Actions: [Add](#) | [List](#) | [Graph](#) | [Report](#)

What's New?



Join the Discussion
Get started in the community.

[Take Me There](#)

Need Training?

Do you need a refresher course to learn some new helpful hints? Then click [here](#) to view our FREE training services.

Quick Launch

[New Request](#)
[Print WO Batch](#)
[Account Settings](#)
[User Forum](#)
[More Services](#)
[My SchoolBuilding](#)

WORK ORDERS BY STATUS

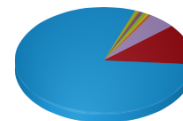
Last 10 Work Requests











Period

Request Totals

- ☒ 21 New Request
0 UNASSIGNED
21 In Approval Process
- ☒ 160 Work In Progress
19 PMs
- ☒ 406 Complete
9 PMs
- ☒ 2615 Closed Work Orders
65 PMs
- ☒ 25 Declined
- ☒ 6 Parts on Order
- ☒ 15 Duplicate Request
- ☒ 2 Void
- ☒ 4 On Hold
4 PMs
- ☒ 2 Waiting More Information
- ☐ 0 Open Extended
- ☒ 24 Pending
24 PMs
- ☒ 6 Waiting Funding
4 PMs

Work In Process



-  New Request
-  Work In Progress
-  Complete
-  Closed Work Orders
-  Declined
-  Parts on Order
-  Duplicate Request
-  Void
-  On Hold
-  Waiting More

WORK CENTER

CALENDAR

8/29/2017 WORK
(Tuesday)

OPEN PM WORK 99

OTHER OPEN WORK 425

TOTAL OPEN WORK 524

Information Analysis

Areas
Budget
Buildings
Classifications
Crafts
Employees
Equipment
Equipment Usage
Groups
Locations
Manufacturers
Outstanding Work

SOFTWARE-WORK ORDERS

Save

Reset

Status ☒

New Request

Status Date

Priority ☒

Low

Created By

Ruthy Bennett

Date Created

Request Info

Location

Arlington High School

Building

<-- Select Building -->

Area

6th Floor

Request Date ☒

9/12/2017



Request Description ☒

A/C is not cooling down areas

Area Number

Superintendent's office

☐ Emergency?

► [Back to Shortcuts](#)

Deferral

New Due Date

Deferred By

SOFTWARE-WORK ORDERS

(Select "OTHER" if requester not in list and type their name in field below.)

Bennett,Ruthy



First Name

Ruthy

Last Name

Bennett

Email

rbennett@town.arlington.ma.us

Phone

781-316-3113

Pager

Cellular Phone

[Back to Shortcuts](#)

Assignment Info

Assigned To

-- Select Assignee --

☒ Route for approval or review?

Target Start Date

9/12/2017



Requested Completion

09/14/2017



Target Completion

Actual Completion

Estimated Costs

0.00

Estimated Hours

0.00

Actual Costs: 0.00 (Note: Actual costs exclude tax amounts.)

Actual Hours: 0.00

Total Costs: 0.00

[Back to Shortcuts](#)

Budget Info

Purpose

*Repair Work/Maintenance

Craft

Air Conditioning

Budget

-- Select Budget Account --

Custom Category

-- Select Custom Category --

SOFTWARE-WORK ORDERS

*Repair Work/Maintenance ▾

Budget

-- Select Budget Account -- ▾

Project

-- Select Project -- ▾

Classification


/HVAC ▾

Type

A/C Units ▾

▶ [Back to Shortcuts](#)

◀ Prev Next ▶

 [Print Form](#)

▶ [Back to Shortcuts](#)

The new work order must be created or saved before messages, notes, transactions and attachments can be added.

Air Conditioning ▾

Custom Category


-- Select Custom Category -- ▾

Equipment

<-- Select Equipments --> ▾

Legend







☒ Required Information

 Automatically saves on click

Ctrl+M Shortcut menu

[Home](#) | [Calendar](#) | [New Work Order](#) | [Reports](#) | [Services](#) | [Account Setup](#) | [MyDude](#)

SOFTWARE-PREVENTIVE MAINT.

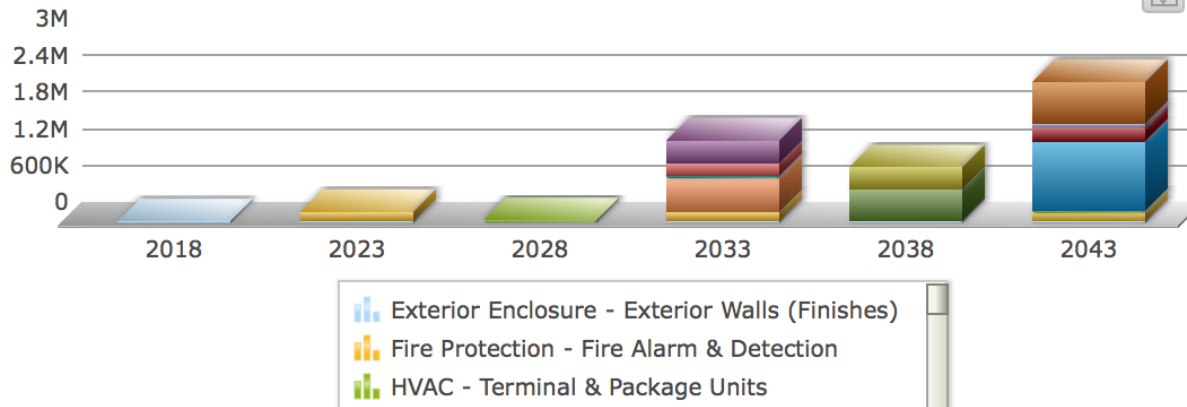
Heating/Ventilation /Air Conditioning	Ruthy Bennett OSullivan, Jeremiah	Monthly - Ottoson - Wood Shop Filters - Refer to PM schedule details.				
6746 	Pending  Ruthy Bennett McCarthy, Michael	Thompson School Thompson School Various Thompson - Fire Extinguishers	7/15/2017 12:34:16 AM 8/17/2017 Hallways	7/15/2017 12:34:16 AM	\$0.00	
Scheduled Fire Protection						
Yearly - Thompson - Fire extinguishers - Refer to PM schedule details.						
6744 	Pending  Ruthy Bennett McCarthy, Michael	Hardy School Hardy School Various	7/15/2017 12:34:15 AM 8/17/2017 Hallways	7/15/2017 12:34:15 AM	\$0.00	
Scheduled Fire Protection						
Yearly - Hardy - Fire extinguishers - Refer to PM schedule details.						
6745 	Pending  Ruthy Bennett McCarthy, Michael	Thompson School Thompson School Cafeteria Thompson - Ansul System	7/15/2017 12:34:15 AM 8/22/2017 Kitchen	7/15/2017 12:34:16 AM	\$0.00	
Scheduled Fire Protection						
Yearly - Thompson - Ansul System - Refer to PM schedule details.						
6742 	Pending  Ruthy Bennett McCarthy, Michael	Ottoson Middle School Ottoson Middle High School Various	7/15/2017 12:34:14 AM 8/17/2017 Hallways	7/15/2017 12:34:14 AM	\$0.00	
Scheduled Fire Protection						
Yearly - Ottoson - Fire extinguishers - Refer to PM schedule details.						
6743 	Pending  Ruthy Bennett McCarthy, Michael	Hardy School Hardy School Cafeteria	7/15/2017 12:34:14 AM 8/22/2017 Kitchen	7/15/2017 12:34:15 AM	\$0.00	
Scheduled Fire Protection						
Yearly - Hardy - Ansul System - Refer to PM schedule details.						
6740 	Pending  Ruthy Bennett McCarthy, Michael	Arlington High School B-Building Cafeteria	7/15/2017 12:34:13 AM 8/22/2017 Kitchen	7/15/2017 12:34:13 AM	\$0.00	
Scheduled Fire Protection						

SOFTWARE-CAPITAL FORECAST

- ☐ Equip & Furnishings - Vehicular Equipment
- ☐ Exterior Enclosure - Exterior Doors
- ☒ Exterior Enclosure - Exterior Walls (Finishes)

Refresh Chart

Needs Forecast by System



< Prev 7 Days Next 7 Days >
8/29/2017 - 9/5/2017

No record found

[+ Add New Reminder](#)

Upcoming Replacements

ANNUAL SCHEDULE

October – meet w principals

November – request summer work projects

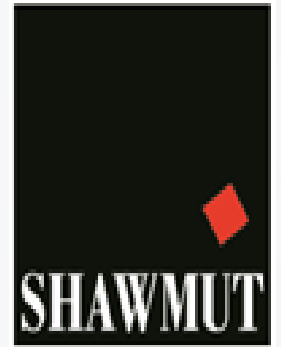
January – review projects with Superintendent

February – finalize summer work

March – go out to bid on capital projects

June – finalize capital projects and schedule for summer work

July/August – summer work and prepare capital requests for next fiscal year



Design and Construction

MATTERPORT CAMERA PRESENTATION

HOW IT WORKS



- 3 cameras and 6 infrared sensors
 - Cameras capture the picture
 - Sensors measure distance to create XYZ points
- Takes scan in 6 x 60 degrees sections to capture a full 360
- Roughly 30' radius of points per scan (better quality w/ more scans)
- Scans will auto align based on points from previous scans
- Camera is cloud based and operated via an ipad using wifi or bluetooth

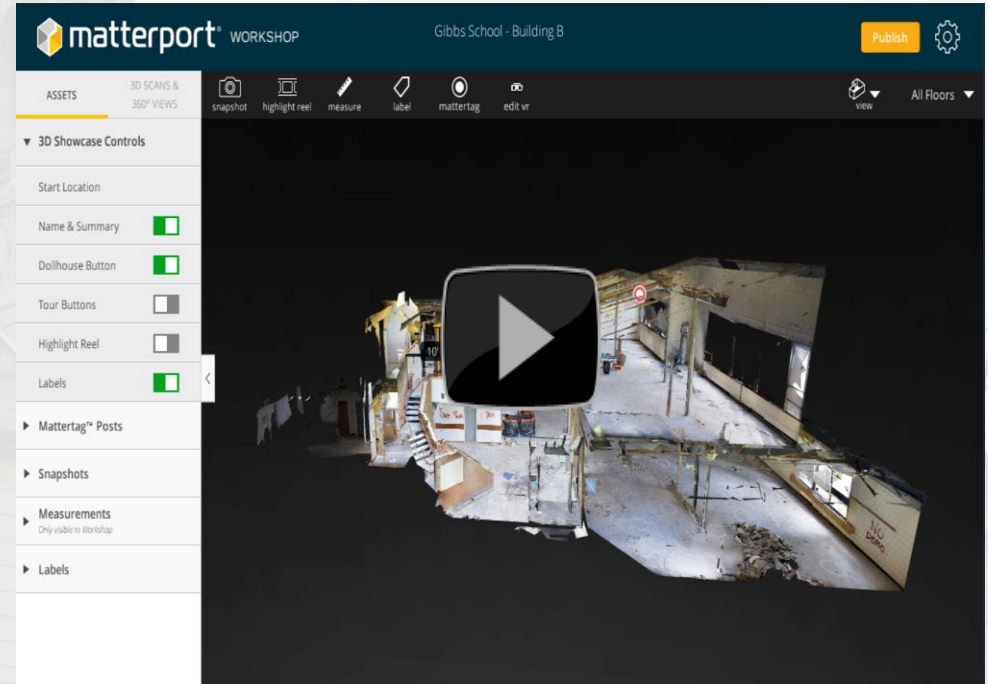


MATTERPORT ONLINE

WORKSHOP VIEWER

- Features

- Visual walkthrough
 - Link can be sent to anyone you would like to be able to view the space
- Snapshots and 360 Snapshots
- Highlight Reel of Key Screenshots
- Measurement Taking
- Space Labeling
- Object Tagging
- Multiple Floors
- VR Goggle Integration



Video link:

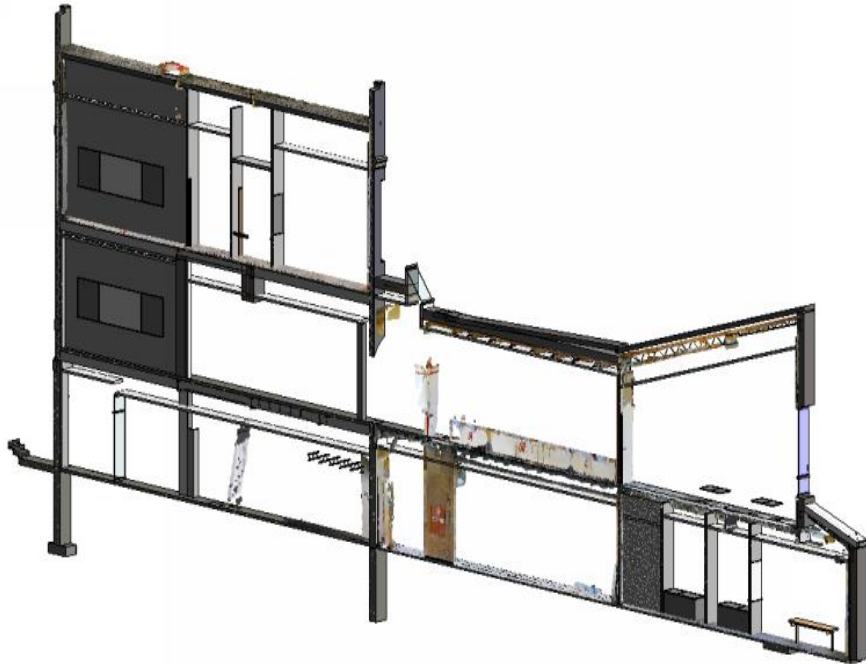
<https://www.youtube.com/watch?v=1HOEQYBARzk&feature=youtu.be>

Model Links

<https://my.matterport.com/models/WwNTqCKJGvU>

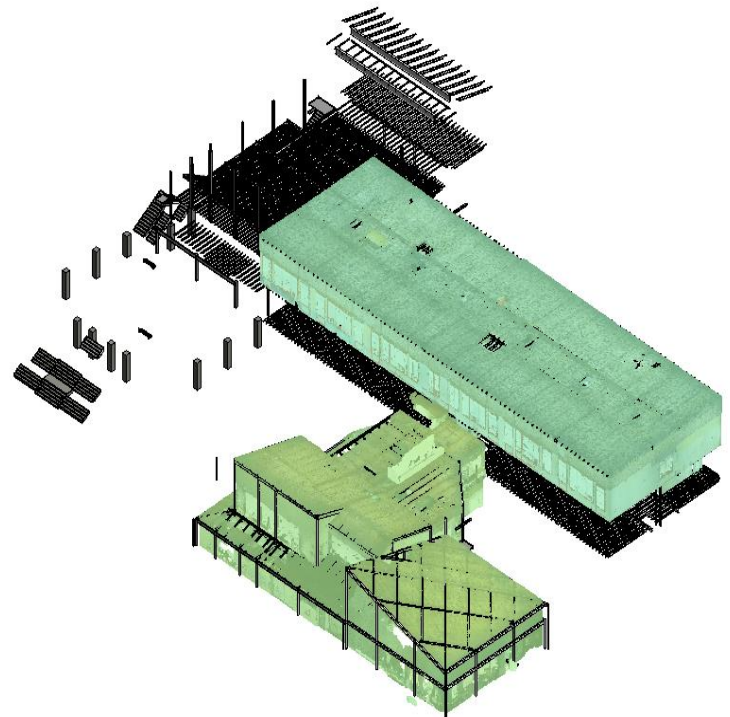
<https://my.matterport.com/models/Rt7qVBCec9N>

SCAN AND MODEL INTEGRATION



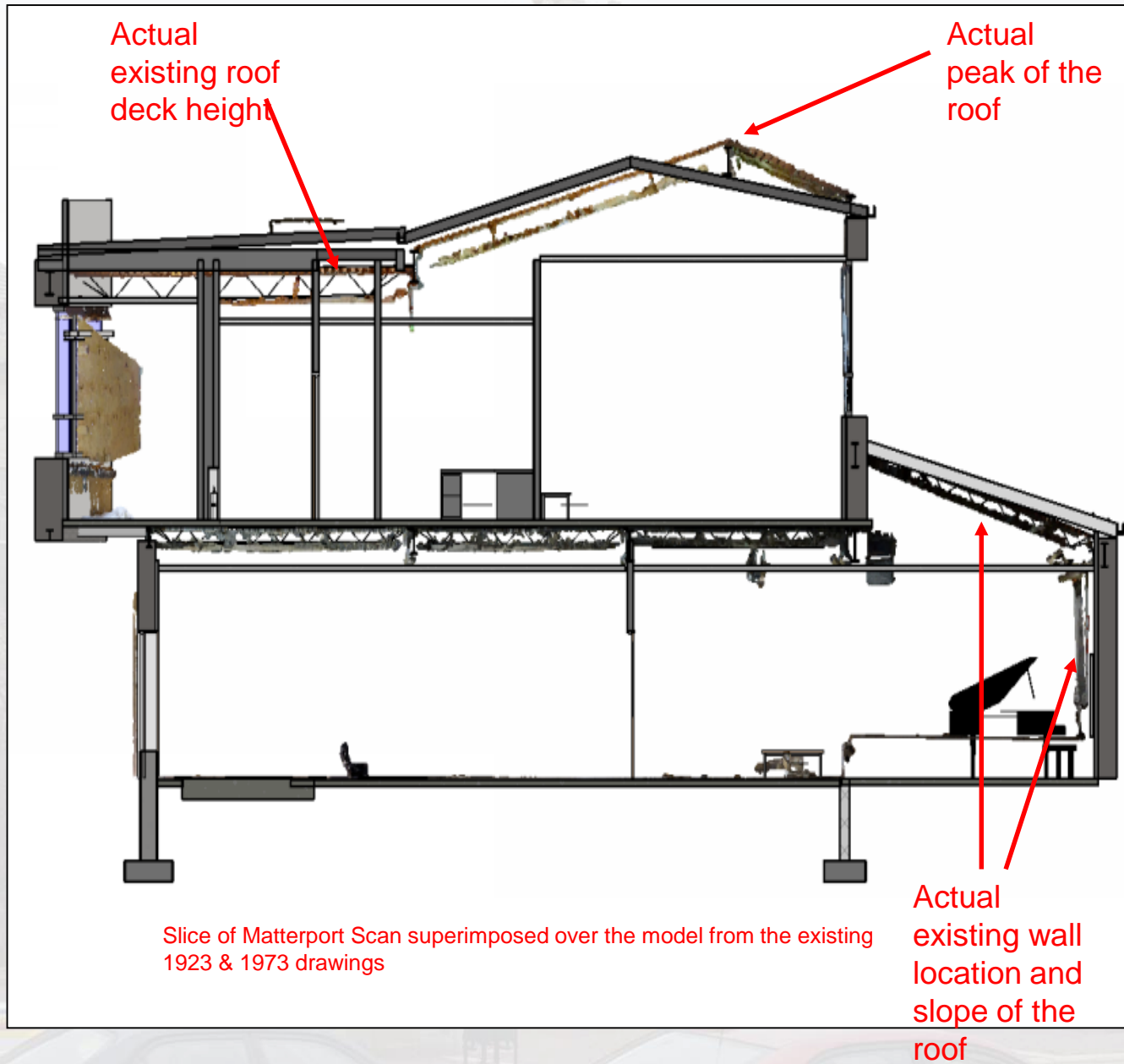
Slice of Matterport Scan superimposed over the model from the existing 1923 & 1973 drawings

Line up the scan with the structural framing to verify beams, columns, joists, etc.

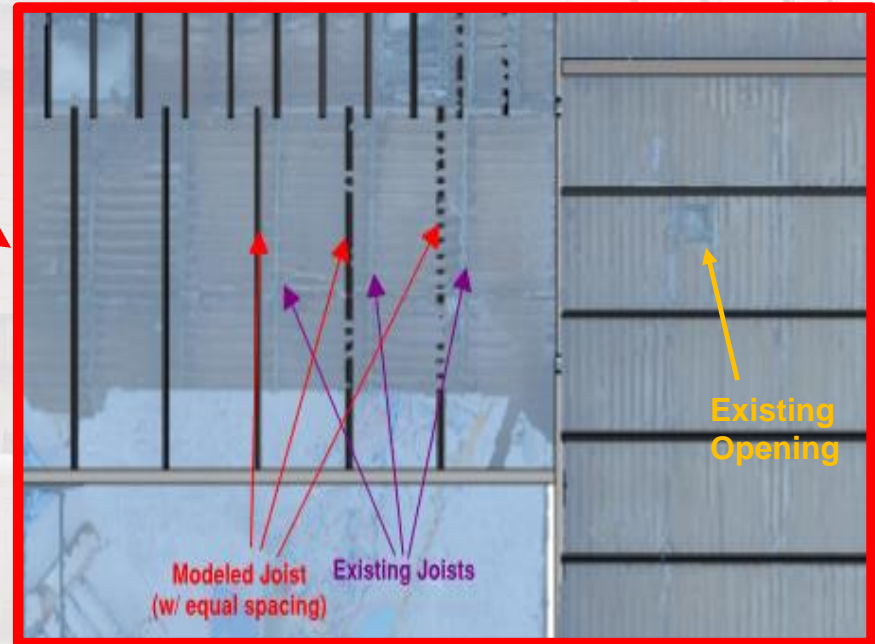


Line up the scan with the Revit model to verify accuracy of floors, walls, windows, ceilings, etc.

EXAMPLES OF IDENTIFIED ISSUES

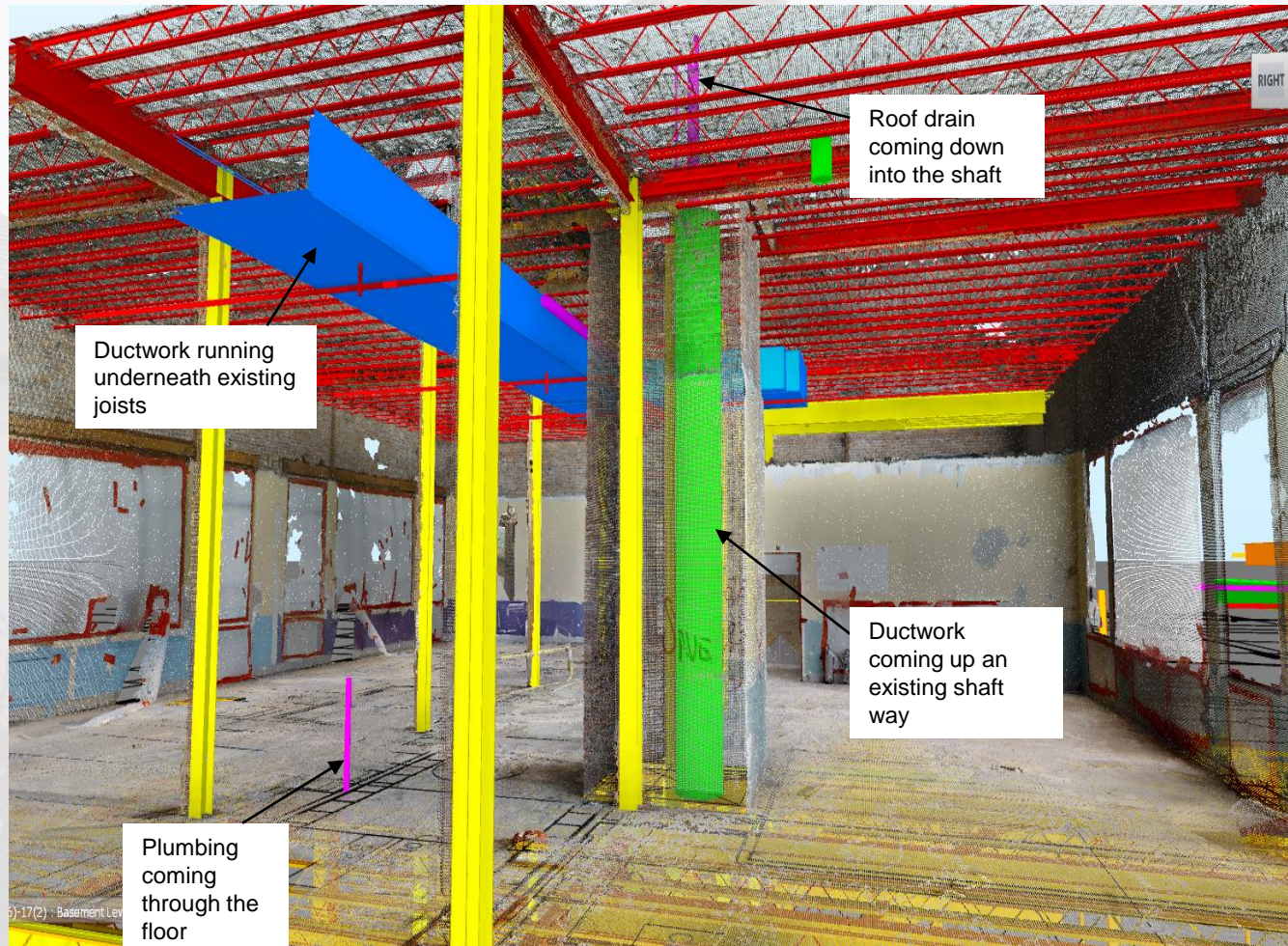


ALIGNMENT/MODELING



- The point cloud can be utilized to model the existing structure
- The existing bar joists were not equally spaced so the scan allowed for the model to be manually

INCORPORATION W/ COORDINATION MODEL



- The point cloud can be imported into the MEP coordination model for visual clashing with existing conditions



Town of Arlington, Massachusetts

7:20 PM OECD Test Update, M. Janger and P. McKnight

ATTACHMENTS:

Type	File Name	Description
▣ Backup Material	2017-03-Arlington+High+School_OECD_9_28_2017.pdf	OECD Report
▣ Presentation	AHS_School_Committee_PISA_Data.pdf	AHS School Committee PISA data



How Your School Compares Internationally

OECD TEST FOR SCHOOLS (BASED ON PISA)



Arlington High School
Arlington School District
MA
USA

How Your School Compares Internationally

OECD TEST FOR SCHOOLS (BASED ON PISA)

ARLINGTON HIGH SCHOOL

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Foreword

Parents, teachers, principals and administrators who are engaged in the running of schools and education systems need reliable information to assess how well their schools prepare students for life. Most monitor students' learning in order to make this assessment. But in a global economy, the measurement of educational success can no longer be based on national standards alone. Comparisons also need to be made with the best-performing schools and education systems internationally. International benchmarking and cross-country comparisons can help to better understand whether the younger generation is well equipped with the skills needed in today's globalized world. They can also offer guidance for governments, administrations and schools on the policies required to catch up with the best performers.

The OECD Programme for International Student Assessment (PISA) has evaluated the quality, equity and efficiency of school systems in over 70 countries that, together, make up nine-tenths of the world economy. In PISA 2012, 65 countries and economies participated. PISA represents a commitment to monitor the outcomes of education systems regularly within an internationally agreed framework and to provide a basis for global collaboration in defining and implementing educational policies.

Results from PISA reveal wide differences in the educational outcomes of countries. Those education systems that have been able to secure strong and equitable learning outcomes, and to mobilize rapid improvements, show others what can be achieved. Some of the strongest examples pertain to those countries that have seen rapid improvements over recent years.

For example, Korea's average performance was already high in 2000, yet the government was concerned that only a small elite achieved levels of excellence in the PISA reading assessment. Within less than a decade, Korea was able to double the share of students demonstrating excellence in this area. In Poland a major overhaul of the school system helped to dramatically reduce performance variability among schools, turn around the lowest-performing schools and raise overall performance by more than half a school year.

The remarkable success of Shanghai in China, which tops the league tables in PISA, also shows the outcomes that can be achieved with moderate economic resources and in a diverse social context. Based on PISA 2012 results in mathematics, a third of Shanghai-China's 15-year-olds can conceptualize, generalize and creatively use information based on their own investigations and modeling of complex problems. They can apply insight and understanding and develop new approaches and strategies when addressing novel situations. In the OECD area, just 3% of 15-year-old students reach that level of performance.

While knowing where a nation's education system stands internationally is important, many schools and local school administrations want to go further and understand how their own individual schools perform compared with the world's leading school systems and other schools operating within a similar social context. The OECD has developed an innovative tool to provide answers to these questions. Similar to the international PISA assessment, the *OECD Test for Schools* (based on PISA) measures 15-year-old students' applied knowledge and competencies in reading, mathematics and science as well as their attitudes toward learning and school.



This report provides results from the *OECD Test for Schools*, together with examples of strategies, policies and practices from education systems around the world to support critical reflection and encourage school staff and local educators to look beyond their classrooms in search of national and global excellence. The OECD stands ready to support all those involved in delivering “better policies for better schools and better lives.”

Angel Gurría
OECD Secretary-General



Acknowledgments

The school reports and the work around the development and implementation of the *OECD Test for Schools* (based on PISA) were produced under the auspices of the OECD Directorate for Education and Skills in consultation with and with guidance from the members of the PISA Governing Board.

The development of the assessment and the implementation of the initial pilot trial in 2012 were made possible thanks to the generous support of the William and Flora Hewlett Foundation, the Carnegie Corporation of New York, the Kern Family Foundation, Bloomberg Philanthropies, America Achieves and the National Public Education Support Fund. Additional support for the pilot trial was provided by the Bechtel Group Foundation, the Stuart Foundation, Blue Valley Schools, Birmingham Public Schools, the Rodel Charitable Foundation of Arizona and the Craig and Barbara Barrett Foundation.

For the current cycle of testing in the United States, we extend our special thanks once again to the William and Flora Hewlett Foundation, the Kern Family Foundation, Bloomberg Philanthropies and America Achieves for all of their efforts and leadership.

The school reports are based primarily on data, comparative analysis, drafting and project coordination originally provided by the PISA-Based Test for Schools team and the PISA team of analysts within the Early Childhood and Schools Division of the OECD Directorate for Education and Skills. As an accredited service provider and platform provider for the online OECD Test for Schools, the Northwest Evaluation Association (NWEA) transitioned the paper and pencil test to a web-based test and conducted the test administration, coding, scoring, scaling and data management and provided the analytical outputs that comprised the school reports.



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Summary of Your School's Results

School	ARLINGTON HIGH SCHOOL
District or Local Authority	Arlington School District
State	MA
Country	USA

This school report presents summary results for **Arlington High School** based on its participation in the *OECD Test for Schools* (based on PISA) in March 2017. The school participated in a school-level assessment based on PISA that measures 15-year-old students' applied knowledge and competencies in reading, mathematics, and science. By participating in the assessment, the school can compare its results with those from the international PISA assessment that was implemented around the world. Over 70 countries and economies have participated in various PISA cycles and these results are used for comparisons in this report.

The results for your school are based on a two-hour assessment administered to 69 students in March 2017. Students were also asked to fill out a questionnaire that was used to obtain information on their socioeconomic backgrounds and on their engagement with and attitudes toward learning and the school learning environment. These results are also presented in this report. The following is a summary of your school's results on the PISA scales of reading, mathematics and science:

Figure A ■ **Your school's mean performance in reading, mathematics and science**

READING		MATHEMATICS		SCIENCE	
Mean performance score	S.E.	Mean performance score	S.E.	Mean performance score	S.E.
603	13.3	613	15.7	594	11.3

S.E.: Standard error.

In reading, the mean performance for students at your school is 603 points, which is *significantly above* the mean performance of 498 points obtained by students across schools in the United States in PISA 2012. In mathematics, your school's mean performance of 613 points is *significantly above* the mean performance of 481 points obtained by students in the United States in PISA 2012. In science, your school's mean performance of 594 points is *significantly above* the average of 497 points for the United States in PISA 2012.

When interpreting these results, it is important to take into account the powerful influence that home background has on learning outcomes. Compared with other schools in the United States, students at your school have socioeconomic backgrounds *above the average*. In this report you will be able to see how your school compares with other schools with a similar socioeconomic profile in the United States and internationally. You will be able to use these comparisons to see if your school performs above or below what would reasonably be expected, given the socioeconomic profile of students at your school.

International context

To put your school's results in an international context, in the highest-performing school system in PISA 2012, Shanghai-China, the mean student performance in reading was 570 points, while in the



lowest-performing OECD country, Mexico, it was 398 points. In mathematics, students across schools in Shanghai-China had a mean performance of 613 points, while in Mexico it was 413 points. As for science, the mean performance in Shanghai-China was 580 points, and in Mexico it was 415 points.

Figure C shows how your school performs in reading, mathematics and science compared to schools in the United States, Shanghai-China and Mexico. The markers on the scales show the cut-off score *above* which schools that account for 10% of students perform for the particular country or economy. The second marker from the top shows the score *above* which 25% of students in schools perform for the country or economy. The middle marker shows the middle point at which 50% of schools perform *above* and *below*. The bottom two markers for each country and economy show the points below which schools that account for 25% and 10% of students perform.

Your school's results across PISA proficiency levels

The PISA frameworks on which the *OECD Test for Schools* has been developed are drawn from the best expertise in assessment practices internationally. Since it is not pegged to a specific curriculum or content standard, the *OECD Test for Schools* provides a broad, more global reflection of the knowledge and skills that students will need in the 21st century.

Students' knowledge and skills are summarized in proficiency levels for each subject. Students who reach the top levels are top performers even when compared with their peers around the world and can be considered as being well on their way to becoming the skilled knowledge workers of tomorrow in different fields. Students who are able to perform at the intermediate levels (baseline Levels 2, 3 and 4) are able to demonstrate the skills and competencies that will allow them to participate productively in life as they continue their studies, as they enter the labor force and as citizens. Students who perform below the baseline levels, in contrast, are at risk of poor educational and labor-market outcomes, according to longitudinal research based on student performance in reading. The following is a summary of how students at your school perform in terms of proficiency levels:

Figure B ■ Levels of proficiency of students at your school

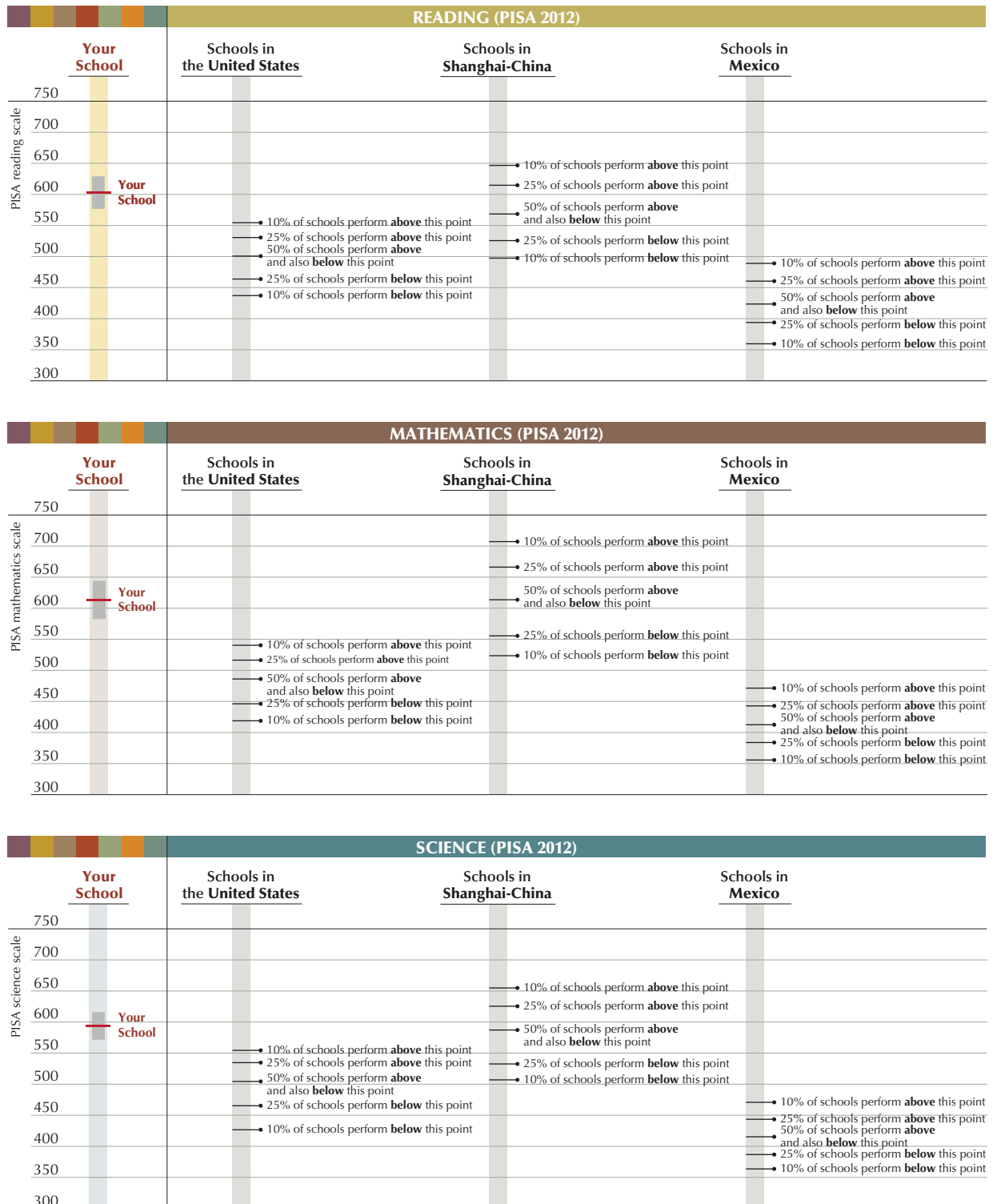
	READING		MATHEMATICS		SCIENCE	
	Percentage of students	S.E.	Percentage of students	S.E.	Percentage of students	S.E.
Top levels (Levels 5 and 6)	43%	7.6	50%	8.5	32%	6.8
Intermediate levels (Levels 2, 3 and 4)	55%	7.6	47%	8.2	66%	7.2
Below baseline level (Level 1 and below)	2%	1.8	4%	2.4	2%	1.8

S.E.: Standard error.

The reading assessment of the *OECD Test for Schools* covers the active, purposeful and functional application of reading in a range of situations and for various purposes. Students at the highest levels of reading proficiency are capable of critically evaluating unfamiliar texts and building hypotheses about them, drawing on specialized knowledge and accommodating concepts that may be contrary to expectations. At your school, 43% of students are proficient at the highest levels internationally. In comparison, 8% of students across schools in the United States and 25% of students in Shanghai-China reached similar levels in PISA 2012.



Figure C ■ How Arlington High School compares with schools in other countries and economies in reading, mathematics and science in PISA



Notes: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance score would fall within this confidence interval. Schools are weighted by the number of students enrolled. For example, the legend "10% of schools perform **above** this point" refers to the highest-performing schools that account for 10% of the total number of students in the country.

Source: OECD.



At the other end of the performance scale, PISA has defined a baseline level of reading proficiency, at which students begin to demonstrate the reading competencies that will enable them to participate effectively and productively in life. At your school, 2% of students do not reach the baseline level of proficiency in reading, compared with 17% of students across schools in the United States and 3% in Shanghai-China in PISA 2012.

The mathematics part of the assessment measures students' capacity to formulate, employ and interpret mathematics in a variety of contexts. Top performers in mathematics are capable of developing and working with models in complex situations, identifying constraints and specifying assumptions. At your school, 50% of students are proficient at the highest levels of mathematics proficiency. In comparison, 9% of students across schools in the United States and 55% of students in Shanghai-China reached these levels in PISA 2012.

Students who perform at the baseline level of proficiency in mathematics can employ basic algorithms, formulae, procedures or conventions and they can interpret and recognize situations in contexts that require no more than direct inference. At your school, 4% of students do not reach at least the baseline level in mathematics, compared with 26% of students in the United States and 4% of students in Shanghai-China in PISA 2012.

The science part of the assessment measures students' capacity to identify scientific issues, explain phenomena scientifically and use scientific evidence as they encounter, interpret, solve and make decisions in life situations that involve science and technology. Students at the highest levels of science proficiency can apply both scientific concepts and knowledge about science to complex life situations. They are able to compare, select and evaluate appropriate scientific evidence for responding to these situations. At your school, 32% of the students are among the top performers internationally. In comparison, 7% of students in the United States and 27% of students in Shanghai-China reached this level of proficiency in PISA 2012.

At the baseline level of proficiency in science, students begin to demonstrate the competencies that will enable them to participate actively in life situations related to science and technology. Students at this level have adequate scientific knowledge to provide possible explanations in familiar contexts or to draw conclusions based on simple investigations. At your school, 2% of the students do not reach at least the baseline level in science, compared with 18% in the United States and 3% in Shanghai-China in PISA 2012.

Some highlights of results for your school

- When looking at the average socioeconomic status of students at your school in relation to their performance, your school performs at the level that would reasonably be expected of schools with similar students in the United States in reading, above the level that would reasonably be expected of schools with similar students in the United States in mathematics, and at the level that would reasonably be expected of schools with similar students in the United States in science – as measured by the OECD Test for Schools (Figures 4.1, 4.2, and 4.3).
- As reported by your students, the disciplinary climate in English lessons at your school is more positive than the average for the 10% highest-performing students in reading for the United States. The reported disciplinary climate in mathematics lessons is similar to the average for the 10% highest performing students in mathematics based on PISA results (Figures 3.1 and 3.2). Students at your school also report that teacher-student relations are similar to the average for the 10% highest-performing students in mathematics for the United States based on PISA results (Figure 3.4).
- Students at your school also report that their instrumental motivation – how useful students believe the study of mathematics and science at school to be for their future – is lower than the average for the United States in PISA for mathematics and higher than the average in science (Figures 3.8 and 3.11). At your school, students' confidence in their ability to successfully deal with mathematics-related tasks (self-efficacy in mathematics) is higher than the average for the United States in PISA and is higher than the average for science related tasks (self-efficacy in science) (Figures 3.9 and 3.12).



Reader's Guide

Understanding the differences between your school assessment and the main PISA studies

Although the *OECD Test for Schools* (based on PISA) is developed from the same assessment frameworks as the main PISA (Programme for International Student Assessment) studies organized every three years by the OECD, the two assessments – and the findings they provide – are different. The OECD created the original PISA assessment in response to its member countries' demands for regular and reliable data on the knowledge and skills of their students, and the performance of their education systems, in an international context. While the PISA assessment is intended to provide aggregate national results for international comparisons and to inform policy discussions, the *OECD Test for Schools* is designed to provide school-level results for benchmarking and school-improvement purposes.

Sources of school information and data

As the accredited service provider in the United States and provider of the online OECD Test for Schools, NWEA organized the assessment with participating schools. The students who were tested at your school and at others responded to approximately two hours of test questions and provided answers to a 30-minute student questionnaire. In addition, the principals or designated officials of the schools where students were assessed provided information on their schools' characteristics by completing a questionnaire.

Other sources of information presented in the report

This report presents information, results and findings from various OECD sources. Primarily, it is based on the *OECD Test for Schools* and results from PISA cycles. Information from the main PISA studies is also included, and most of the international comparisons between your school's results and PISA results combine both of these sources. In addition, the report presents findings and information gleaned from PISA over the years as well as recent OECD research and resources on successful education systems, increasing equity and improving schools.

Data underlying the figures

Because of the nature of the assessment that your school participated in, your school's results will not be made available publicly. The results for your school and others participating in the assessment are confidential. The data for those figures where "countries that participated in past PISA cycles" are cited can be found in the reports of PISA 2009 and PISA 2012 results. As a reference point for the most recent PISA cycle in 2012, an overview of results for all countries and economies that participated in 2012 is presented as an annex to this report.

Focusing on statistically significant differences

This report discusses differences or changes that are statistically significant and, in some cases, results that are not statistically significant. Differences that are statistically significant are clearly indicated.

As a rule, PISA reports differences with a 95% confidence threshold, and this convention has been followed in this report. This refers to the fact that if the measurement were to be replicated several times, a difference of that size, smaller or larger, would be observed less than 5% of the time if there were actually no difference in corresponding population values.

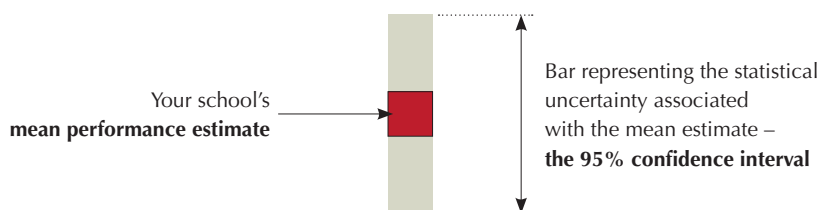


Standard error (S.E.)

Whenever relevant, standard errors are included for performance estimates. Standard errors are used to express the degree of uncertainty associated with sampling, measurement and equating error. A larger sample usually reduces the standard error; however, even if a school tests all of its 15-year-olds, the standard error will not be eliminated as there will still be measurement and equating error. All standard errors in this report have been rounded to one decimal place. Thus, where the value 0.0 is shown, this does not imply that the standard error is zero, but that it is smaller than 0.05.

Confidence intervals

Whenever mean results for your school or for subgroups of students within your school are presented graphically in this report, you will notice a gray bar above and below the marker for your school. The bar indicates the statistical uncertainty (or “confidence interval”) associated with the result. In technical terms, the error bar represents the 95% certainty with which your school’s result is estimated to lay within the error bars, were the test to be replicated several times with different student samples in your school.



A note on statistical concepts and terminology for meaningful comparisons

The reader will find several statistical concepts and terms used throughout the school report. As with any estimate or measurement, there is a certain degree of uncertainty. The degree of error is associated with the scores describing student performance in reading, mathematics and science, for example, as these scores are estimated based on student responses to test items. As described earlier, a statistic called the **standard error** (S.E.) is used to express the degree of uncertainty associated with sampling, measurement and equating error. The standard error can be used to construct a **confidence interval**, which provides a means of making inferences about the population averages and proportions in a manner that reflects the uncertainty associated with sample estimates. A 95% confidence interval is used in this report and represents a range of plus or minus about two standard errors around the sample average. Using this confidence interval it can be inferred that the population mean or proportion would lie within the confidence interval in 95 out of 100 replications of the measurement, using different samples randomly drawn from the same population.

When comparing scores among countries, economies, provinces or groups of schools, the degree of error in each average must be considered in order to determine if the true population averages are likely different from each other. Standard errors and confidence intervals may be used as the basis for performing these comparative statistical tests. Such tests can identify, with a known probability, whether there are actual differences in the populations being compared.

For example, when an observed difference is significant at the 0.05 level, it implies that the probability is less than 0.05 that the observed difference could have occurred because of error from sampling, measurement or linking. Only statistically significant differences at the 0.05 level are noted in this report, unless otherwise stated. Averages did not differ unless the 95% confidence intervals for the averages being compared did not overlap.

Reproduced and edited from Brochu, P., T. Gluszynski and T. Knighton, [Measuring Up: Canadian Results of the OECD PISA Study: The Performance of Canada's Youth in Reading, Mathematics and Science](#), Minister of Industry, Canada, 2010.



Rounding figures

Because of rounding, some values in figures might not exactly add up to the totals. Totals, differences and averages are always calculated on the basis of exact numbers and are rounded only after calculation.

OECD averages

The average for OECD countries is often presented in this report. The OECD average refers to the arithmetic mean of the respective country estimates that make up the OECD (34 countries in 2014).

Abbreviations used in this report

ESCS	PISA index of economic, social and cultural status
GDP	Gross domestic product
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
PPP	Purchasing power parity
S.D.	Standard deviation
S.E.	Standard error

Active hyperlinks included in the report

Numerous active hyperlinks are included throughout the report, and the reader is invited to explore these additional resources that include relevant PISA and OECD reports, websites and videos.

Further information

For more information on the PISA results, the PISA assessment instruments, the methods used in PISA and PISA in general, please visit [OECD PISA](#).



Introduction: Understanding Your School's Results

The *OECD Test for Schools* (based on PISA) is a student assessment that is linked to the knowledge base of the OECD's internationally recognized Programme for International Student Assessment (PISA), a description of which is presented in this section of the report. While the international PISA assessment is intended to provide aggregate national results for international comparisons and to inform policy discussions, the *OECD Test for Schools* is designed to provide school-level results for benchmarking and school-improvement purposes. It allows schools to assess and benchmark their students' proficiency in reading, mathematics and science and to benchmark their performance against that of their peers in their country as well as in some of the world's highest-performing schools. This section of the report presents an overview of what the assessment measures and how it does so, and it also describes the contents of the report.



THE OECD TEST FOR SCHOOLS (BASED ON PISA): AN OVERVIEW

Are 15-year-old students at your school prepared to meet the challenges of the future? Can they analyze, reason and communicate their ideas effectively? Have they developed the knowledge and skills that are essential for their successful participation in societies of the 21st century? The *OECD Test for Schools* seeks to answer these questions through a student assessment that is directly linked to the knowledge base of the internationally recognized Programme for International Student Assessment (PISA).

This report presents your school's results from the *OECD Test for Schools* assessment. It allows you to compare your students' level of proficiency in three key subjects with the levels of peers in your country and in some of the world's highest-performing school systems. The results can be used as a gauge of how prepared students at your school are to succeed in a global economy and to set targets that go beyond local and national expectations. This report will also provide you with examples of school practices from countries that have shown consistently high results and from countries that have shown considerable progress as a result of successful school improvement efforts and educational reforms.

Your school's results from the *OECD Test for Schools* are comparable to the same scales as used in the PISA assessment that covers students and schools from more than 70 countries and economies (see Box 1.1). Like the international PISA assessments, the *OECD Test for Schools* measures 15-year-old students' applied knowledge and competencies in *reading*, *mathematics* and *science*. The assessment seeks not only to determine whether students can reproduce knowledge, but also to examine how well they can extrapolate from what they have learned and apply it in unfamiliar settings, both within and outside of school.

Although the *OECD Test for Schools* is based on the same assessment frameworks as the international PISA assessment, it is important to note that the two assessments are different. While the international PISA assessment is intended to provide aggregate national results for international comparisons and to inform policy discussions, the *OECD Test for Schools* is designed to provide school-level results for benchmarking and school-improvement purposes.

Box 1.1 An introduction to PISA and the OECD

The Programme for International Student Assessment (PISA) is an international study that was launched in 1997 by the Organisation for Economic Co-operation and Development (OECD). PISA measures the competencies, skills and knowledge of 15-year-old students in countries around the world. The study is organized by the OECD every three years and aims to provide internationally comparable evidence on the quality and equity of student learning outcomes. In PISA 2012, 65 countries and economies participated, representing 80% of the world's GDP.

The OECD is an international organization that seeks to improve the economic and social well-being of people around the world. The organization assists countries by providing empirical evidence and policy insights to support dialogs and reform processes. In the field of education, the OECD helps member countries improve the quality, equity and effectiveness of their education systems. The organization, headquartered in Paris, France, was founded in 1961 by 20 countries including Canada, the United Kingdom and the United States. In 2014, it consisted of 34 member countries.

Since 2000, the OECD and national partners in participating countries have implemented PISA through an assessment of a randomly selected group of 15-year-old students. The students and participating school authorities (e.g., principals, directors) also fill in background questionnaires to provide information on the students' family background and the way their schools are run. PISA has also implemented a parent questionnaire that countries can choose to administer. It seeks information on the household environment and parental involvement in their children's learning.

...



For each cycle of PISA, one subject is the main area of assessment. In 2000, the focus of the assessment was *reading*; in 2003, *mathematics*; in 2006, *science*; in 2009, *reading* was once again the focus; and in 2012, *mathematics* was the main assessment domain. The results for PISA 2012 are presented in several volumes:

- Volume I, [*What Students Know and Can Do: Student Performance in Mathematics, Reading and Science*](#), summarizes student performance in the countries that participated in PISA 2012.
- Volume II, [*Excellence through Equity: Giving Every Student the Chance to Succeed*](#), examines how factors such as socioeconomic background and immigrant status affect student and school performance. It also looks at the role that education policy can play in moderating the impact of these factors.
- Volume III, [*Ready to Learn: Students' Engagement, Drive and Self-Beliefs*](#), explores the information gathered on students' levels of engagement in reading activities and attitudes toward reading and learning.
- Volume IV, [*What Makes Schools Successful? Resources, Policies and Practices*](#), explores the relationships between student-, school- and system-level characteristics and educational quality and equity.
- Volume V, [*Creative Problem Solving: Students' Skills in Tackling Real-Life Problems*](#), presents student performance in the PISA 2012 assessment of *problem solving*, which measures students' capacity to respond to non-routine situations.
- Volume VI, [*Students and Money: Financial Literacy Skills for the 21st Century*](#), examines students' experience with and knowledge about money.

The figures and tables presented in the PISA reports include StatLinks®, which allows the reader of the e-books to click and download the data in Excel™ files. In addition to the main PISA initial reports, there is a monthly series called "PISA in Focus," which describes a policy-oriented PISA topic in a concise, user-friendly way. The following are some recent editions of the PISA in Focus series:

- [*PISA in Focus 41: Do 15-year-olds know how to manage money?*](#)
- [*PISA in Focus 40: Does pre-primary education reach those who need it most?*](#)
- [*PISA in Focus 39: Are grouping and selecting students for different schools related to students' motivation to learn?*](#)
- [*PISA in Focus 38: Are 15-year-olds creative problem-solvers?*](#)

The PISA 2012 data collection focused on mathematics and included an optional computer-based assessment of mathematics and reading involving 32 countries. It also included an optional area of assessment: *financial literacy*, which 18 countries decided to implement. Detailed results of PISA 2012 were published in December 2013.

PISA not only seeks to assess whether students can reproduce knowledge, but also examines how well they can extrapolate from what they have learned and apply it in unfamiliar settings, both in and outside of school. A description of the assessment frameworks is presented in Box 1.2.

To find out more about PISA and the OECD, go to:



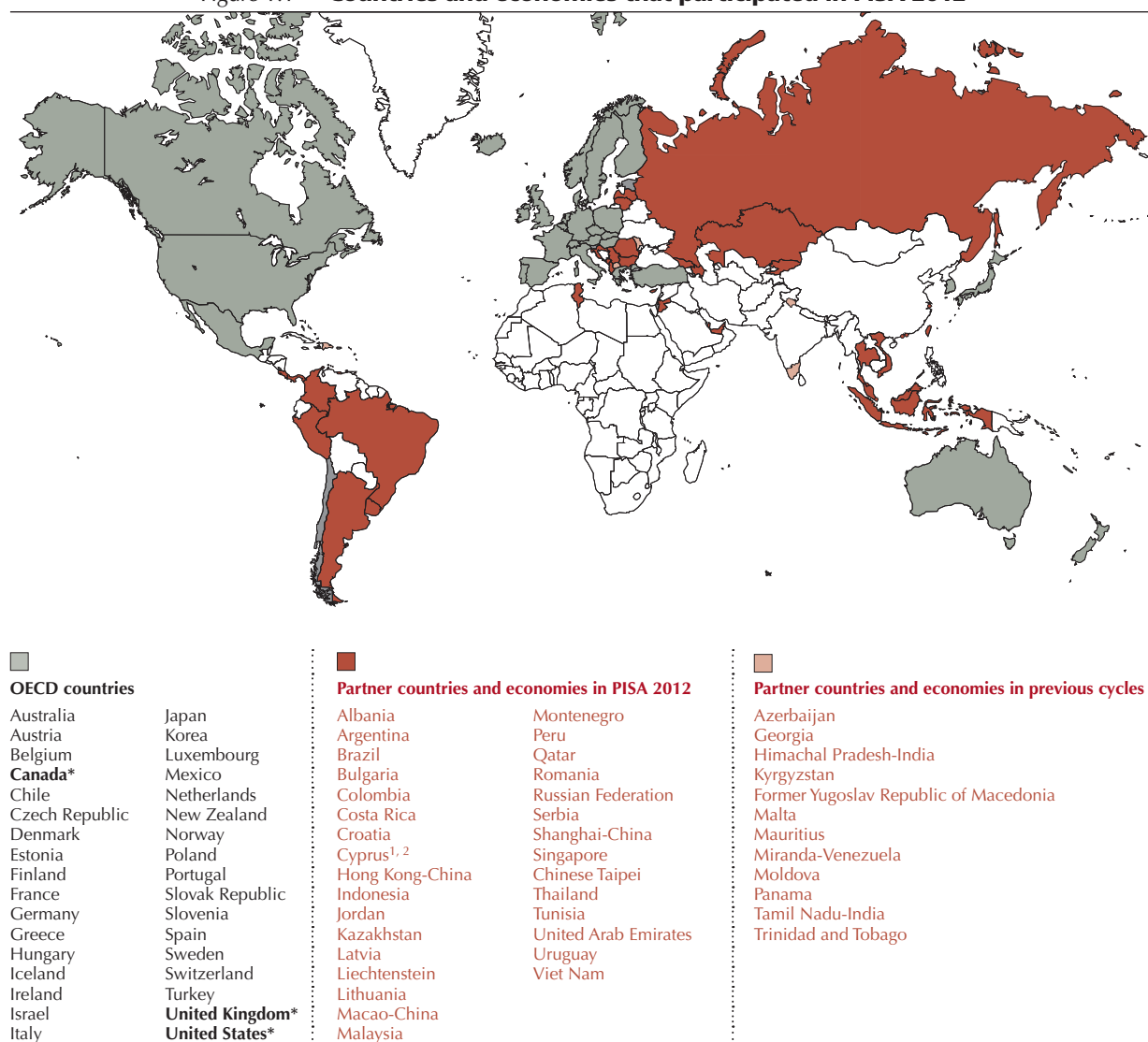
-  [PISA – Measuring student success around the world \(video\)](#)
- [PISA 2012 Key Findings](#)
- [Explore PISA 2012 Mathematics, Problem Solving and Financial Literacy Test Questions](#)
- [PISA in Focus series](#)
-  [About the OECD \(video\)](#)



Figure 1.1 ■ Countries and economies that participated in PISA 2012



* Schools from these countries participated in the pilot trial of the school-level assessment.

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue."

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognized by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

WHAT THE OECD TEST FOR SCHOOLS MEASURES AND HOW

The *OECD Test for Schools* follows the internationally recognized assessment frameworks used in the PISA studies. The frameworks were developed by international experts and are updated continuously to reflect subject matter developments and progress in assessment methods (see Box 1.2). The frameworks are based on the concept of literacy, which includes students' capacity to extrapolate from what they have learned and apply their knowledge and skills in real-life settings, as well as their capacity to analyze, reason and communicate effectively as they pose, interpret and solve problems in a variety of situations.



Like the international PISA test, the *OECD Test for Schools* is developed around units. A unit consists of stimulus material, including texts, diagrams, tables and/or graphs, followed by a question on various aspects of the text, diagram, table or graph, with the questions constructed so tasks that students have to undertake are as close as possible to those they might come across in the real world. The *OECD Test for Schools* contains 47 questions in reading, 40 in mathematics and 54 in science. Example questions developed for the test are included in Annex C, and you can see all of the publicly available PISA questions in the publication [Take the Test: Sample Questions from OECD's PISA Assessments](#).

The test questions vary in format. Around half require students to construct their own responses. Some require a brief answer, whereas others allow for different individual responses and, sometimes, an assessment of students' justification of their viewpoints. The other half are multiple-choice questions in which students make either one choice among four or five alternatives or choose one of two possible responses ("yes"/"no" or "agree"/"disagree") to a series of propositions or statements. The questions are grouped into seven test forms that each take up 120 minutes of testing time. Each test form covers a selection of questions, so that students answer overlapping groups of questions. Thus, the students are tested in a wide range of topics while limiting the test time.

What is meant by PISA scales and proficiency levels?

The PISA scales enable comparisons of the mean performance scores in reading, mathematics and science for different groups of students, such as students in two countries or students in a particular school with other students across the country. The scales are a common feature in all PISA studies that take place every three years.

Student performance on the PISA scales can be divided into proficiency levels that make the score points more meaningful with regards to what students are expected to know and be able to do at different levels of performance. Every proficiency level in reading, mathematics and science indicates a specific level of student ability based on the tasks that students at this level are able to respond to successfully. Level 2 is a particularly important threshold, as PISA considers it to be a baseline level of proficiency at which students begin to demonstrate the competencies that will enable them to participate effectively and productively in life as continuing students, workers and citizens.

At the upper end of performance, Levels 5 and 6 are the highest levels of proficiency in PISA. How successful schools and education systems are in developing students who perform at these levels is particularly relevant when looking at long-term global competitiveness. Detailed descriptions of the proficiency levels are included in Section 2 of the report.

Contextual questionnaires

Apart from the cognitive test items, the assessment includes two contextual questionnaires. One is completed by the principal or designate and covers such elements as the structure and organization of the school, student and teacher demographics and the school's resources, policies and practices. Another questionnaire is completed by every student who participates in the assessment and includes questions about the student's family and home, the classroom and school climate and the student's strategies, attitudes and dispositions toward learning in reading, mathematics and science.





HOW YOUR SCHOOL'S RESULTS ARE PRESENTED IN THIS REPORT

In this report your school's results will be compared with results from past PISA cycles. The results are presented in the following four sections:

Section 2, *What Students at Your School Know and Can Do in Reading, Mathematics and Science*, allows the reader to become familiar with the school's results, before these are placed in an international context. The section describes the school's performance in terms of school-level means and students' distribution in the PISA proficiency levels, including the percentage of highest-performing students and students who do not reach the baseline level of proficiency. The section also shows how your school performs compared with similar schools across the country in terms of the students' socioeconomic backgrounds.

Section 3, *Student Engagement and the Learning Environment at Your School in an International Perspective*, describes the teacher-student relations at your school, the disciplinary climate in the classrooms and the students' attitudes toward learning as reported by the students in the contextual questionnaires. The section shows how these elements are related to student performance at your school and explains international findings on the relationship between the learning environment and the students' learning outcomes.

Section 4, *Your School Compared with Similar Schools in Your Country*, focuses on the relationship between the socioeconomic status of students at your school and their performance relative to students and schools in your country based on PISA 2012 results. PISA results have shown that it is useful not only to look at absolute performance but to also consider the degree to which students come from advantaged or disadvantaged backgrounds. The section also shows the performance of your school in the context of public and private schools in your country and shows how performance can be considered relative to the average socioeconomic status of students.

Section 5, *Your School's Results in an International Context*, places your school's results in an international context for benchmarking. Your school will be compared with PISA 2012 results for a selected group of 12 countries and economies, most of which are the highest-performing or have undertaken significant reforms and seen rapid improvements. The section includes a comparison between how students at your school perform compared with students in similar schools in Shanghai-China, the world's highest-performing education system, and in Mexico, the lowest-performing country in the OECD area.

The annexes include a technical overview of the assessment, a summary of how the test was carried out at your school, examples of test questions and tables of the most relevant results for all countries and economies that participated in PISA 2012.

Throughout the report you will find international case stories and insights on successful school improvement efforts gleaned from PISA and other OECD research on education. You will find text boxes that describe how some schools and educators have succeeded in implementing reforms and how they have tackled low performance and cultivated talented students. You will also find links to additional resources, such as a video series that showcases local educators and policy makers from around the world telling their own stories about how they succeeded in improving student outcomes.





Box 1.2 **An introduction to the PISA assessment frameworks**

The PISA frameworks focus on students' capacity to analyze, reason and communicate effectively as they pose, solve and interpret problems in a variety of situations. Age 15 is chosen as the target population of PISA because at this age students are approaching the end of compulsory education in most OECD, and many non-OECD, countries.

Competence involves far more than the capacity to reproduce accumulated knowledge. The PISA assessment frameworks define competence as the ability to successfully meet complex demands in varied contexts through the mobilization of psychosocial resources, including knowledge and skills, motivation, attitudes, emotions and other social and behavioral components. Within this definition, the first PISA assessments have focused on literacy skills, defined as the capacity of young adults to access, manage, integrate and evaluate information; to think imaginatively; to hypothesize and discover; and to communicate their ideas effectively. The reasoning behind shifting the emphasis from assessing whether students can reproduce what they have learned toward whether they can extrapolate from what they have learned and apply their competencies in novel situations derives from the nature of knowledge and skills required in modern life: tasks that can be solved through simple memorization or with pre-set algorithms are those that are also easiest to digitize, automate and contract offshore, and thus will be less relevant in a modern knowledge-based society.

To underscore the development process of the PISA frameworks, including but not limited to the areas of reading, mathematics and science, the following summarizes relevant milestones since the first cycle of the assessment in 2000 up to the most recent cycle in 2012, when mathematics was the focus:

- In 2000, PISA began with a focus on reading literacy, examining students' capacity to use, interpret and reflect on written material.
- In 2003, PISA focused on the capacity of students to put mathematical knowledge into functional use in a multitude of situations in varied, reflective and insight-based ways. Contrary to traditional school mathematics, often taught in an abstract mathematical world and in ways that are removed from authentic contexts, PISA tried to highlight the usefulness of mathematics in the real world. To succeed in PISA, students had to draw connections between the real world and the mathematical one, often in complex open-ended tasks. Many of the PISA tasks therefore confronted students with real-life problems in open-ended format. As a first step, students had to translate the situation or problem they faced into a form that exposed the relevance of mathematics. They then had to make the problems amenable to mathematical treatment, using relevant knowledge to solve problems, and finally to evaluate the solution in the original problem context.
- Also for PISA 2003, problem solving was included as an additional assessment domain. Since that assessment, considerable research has been undertaken in the areas of complex problem solving, transfer, computer-based assessment of problem solving and large-scale assessment of problem-solving competency.¹ This research has led to advances in understanding and measuring individuals' problem-solving capabilities and is the basis for the development of the PISA 2012 problem-solving framework described later in this note.
- PISA's development continued with an assessment in science in 2006 that focused on students':
i) scientific knowledge and use of that knowledge to identify questions, to acquire new knowledge, to explain scientific phenomena and to draw evidence-based conclusions about science-related issues; *ii)* understanding of the characteristic features of science as a form of human knowledge and inquiry; *iii)* awareness of how science and technology shape our material, intellectual and

1. See e.g.: Blech & Funke (2010); Klieme (2004); Mayer (2002); Mayer & Wittrock (2006).



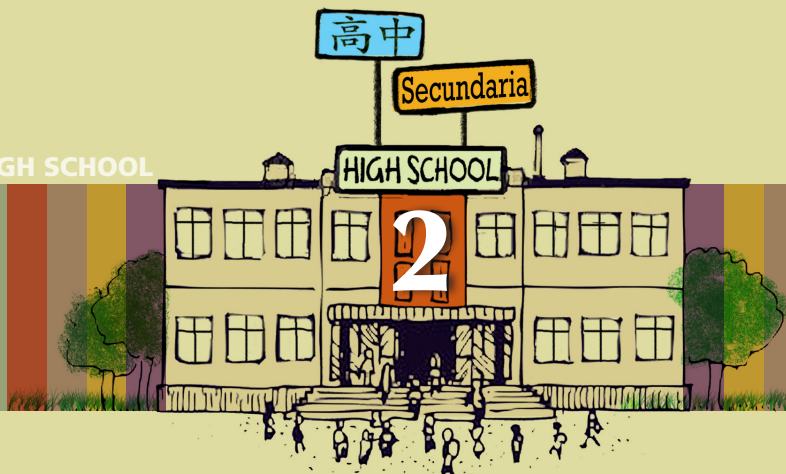
cultural environments; and iv) willingness to engage with science-related issues, and with the ideas of science, as reflective citizens. PISA has also begun to look at students' dispositions to learning, their approaches to learning, their self-concept and their engagement with school more generally.

- For PISA 2009, reading literacy was once again the main domain, as it had been in the initial 2000 assessment. Based on progress in research and methods, however, important additions and developments were incorporated into the updated 2009 reading literacy framework. In addition to incorporating electronic texts, the PISA 2009 framework elaborated the constructs of *reading engagement* and *metacognition* (the awareness of and ability to use a variety of appropriate strategies when processing texts in a goal-oriented manner), given their importance to reading proficiency and the students' responsiveness to teaching and learning.
- In PISA 2012, the main area of assessment was mathematics, as it was in 2003. The assessment focused on an individual's capacity to formulate, employ and interpret mathematics in a variety of contexts. It included reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena. PISA assists students in recognizing the role that mathematics plays in the world and measures not just the extent to which students can reproduce mathematical content knowledge, but also how well they can extrapolate from what they know and apply their knowledge of mathematics in both new and unfamiliar situations. This is a reflection of modern societies and workplaces, which value success not by what people know, but by what people can do with what they know. The focus on real-life contexts is also reflected in the reference to using "tools" that appears in the PISA 2012 definition of mathematical literacy. The word "tools" here refers to physical and digital equipment, software and calculation devices that have become common in 21st-century workplaces.
- In addition, in PISA 2012, the computer-based assessment of problem solving was implemented as a core element in 44 countries and economies. Moreover, the financial-literacy framework developed served as the basis for an optional assessment in this domain in which 18 countries participated. Similarly, 32 participating countries and economies applied the optional computer-based assessment of reading and mathematics. As discussed in the following section, the PISA frameworks exploit the potential benefits provided by computer-delivered assessments.
- The 2015 PISA cycle will focus on scientific literacy as the major domain once again (as in 2006), and work is currently underway to review and revise the scientific literacy framework, including the possibility for computer delivery. Building on the problem-solving framework developed for the 2012 cycle, an important aspect for 2015 is the intent to include a computer-based assessment of *collaborative problem-solving skills*. Because engaging other students in a collaborative group effort requires additional cognitive and social skills for teamwork and interpersonal interactions, the computer-based collaborative problem-solving assessment represents a step toward assessing interpersonal competencies.

To find out more about PISA Assessment Frameworks, go to:

[*PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy*](#)





What Students at Your School Know and Can Do in Reading, Mathematics and Science

This section provides an overview of your school's performance in the *OECD Test for Schools* (based on PISA). It then describes what students at your school know and can do in each of the three assessment domains of reading, mathematics and science, focusing on the distribution of the highest- and lowest-performing students and on the kinds of tasks that they are able to perform. The section highlights the importance of the PISA proficiency levels in understanding the results from the assessment.



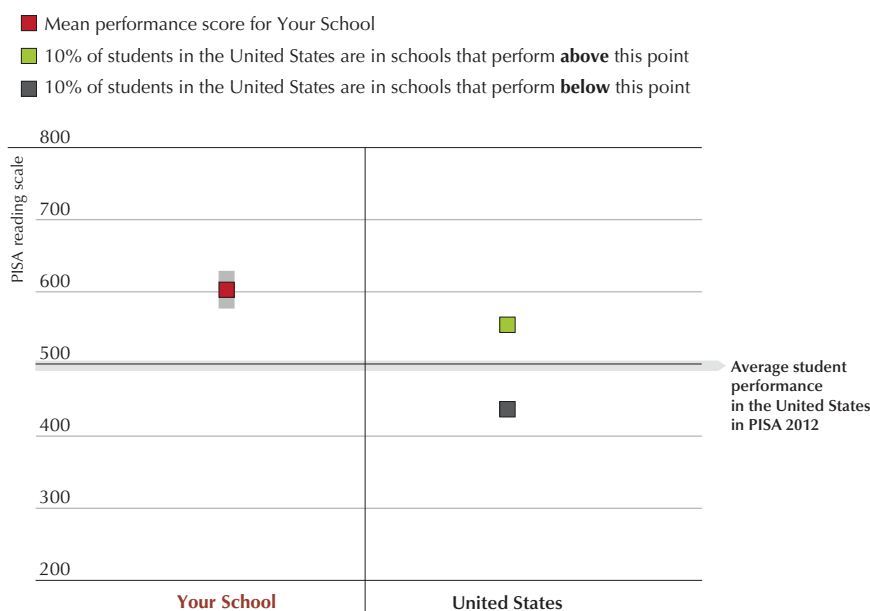
A PROFILE OF STUDENT PERFORMANCE AT YOUR SCHOOL COMPARED WITH THAT OF THE UNITED STATES

As discussed in the previous section, the *OECD Test for Schools* measures students' knowledge and skills in three core subjects: reading, mathematics and science. To better understand your school's performance results, it is useful to begin by comparing them with the performance of students in other schools in your country. Figures 2.1a to 2.1c show the mean performance results for your school in reading, mathematics and science in relation to the highest- and lowest-performing students and schools in your country.

On the right-hand side of the charts you will see two performance thresholds related to the highest-performing schools and the lowest-performing schools in the United States in PISA 2012. At the higher end of performance, the upper marker indicates the point *above* which the highest-performing schools that account for 10% of the students in the United States perform. At the lower end of performance, the lower marker indicates the point *below* which the lowest-performing schools that account for 10% of students in the United States perform. The schools that are neither highest- nor lowest-performing – accounting for the remaining 80% of students in the United States – perform between the two points. The figures also include the average performance scores for students in the United States in PISA 2009 in reading, mathematics and science shown by the shaded lines.



Figure 2.1a ■ **Your school's performance in reading compared with schools in the United States in PISA 2012**

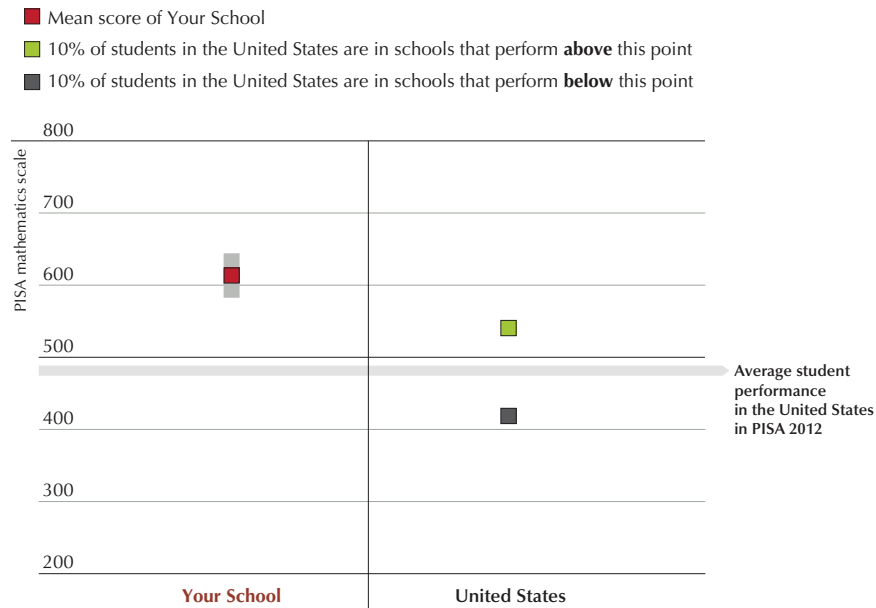


Note: Shaded bars above and below the mean score represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times to students, your mean performance score would fall within this confidence interval.

Source: OECD.



Figure 2.1b ■ **Your school's performance in mathematics compared with schools in the United States in PISA 2012**

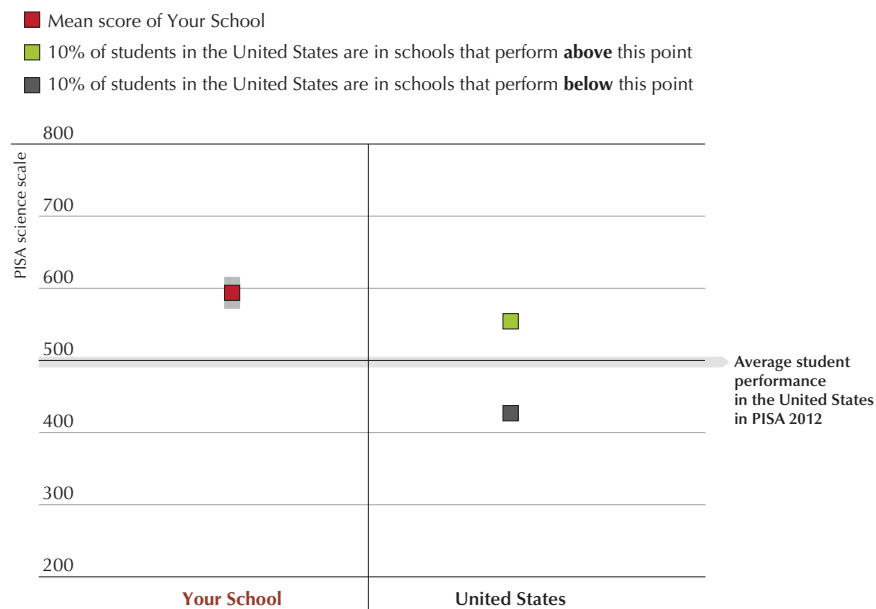


Note: Shaded bars above and below the mean score represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times to students, your mean performance score would fall within this confidence interval.

Source: OECD.



Figure 2.1c ■ **Your school's performance in science compared with schools in the United States in PISA 2012**



Note: Shaded bars above and below the mean score represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times to students, your mean performance score would fall within this confidence interval.

Source: OECD.



Student performance in the United States

In the United States, the average reading performance of 15-year-old students in PISA 2012 is 498 score points on the reading scale, which is not statistically different from the average of 496 points in OECD countries. Among OECD countries, Japan, Korea and Finland are among the highest-performing countries in PISA 2012, with averages of 538, 536 and 524 points, respectively. Among countries and economies that participated in PISA 2012 but that are not members of the OECD, Shanghai-China, Hong Kong-China and Singapore were among the highest performers in reading. At 499 score points on the reading scale, the United Kingdom performed around the OECD average in PISA 2012, similarly to the United States. Among OECD countries, Chile and Mexico are the lowest-performing countries, with reading scores of 441 and 424, respectively, while the non-OECD country Peru is one of the lowest performers overall, with an average score of 384 in reading.

In mathematics, the performance of the United States in PISA 2012 (481 score points) is below the OECD average (494 score points). The highest-performing education system in PISA is that of Shanghai-China, with an average score of 613 points. Hong Kong-China, Korea and Singapore are other top performers in mathematics.

The science performance of students in the United States is 497 points, not statistically different from the OECD average. The highest-performing education systems in science are also top performers in reading and mathematics. Shanghai-China has a mean performance of 580, making it the highest-performing education system in PISA 2012. Students in Japan, Hong Kong-China and Singapore are other top performers internationally.

The United States has participated in every cycle of PISA since 2000. PISA results therefore allow the performance of students in the United States to be compared with that of their peers throughout the world and to identify trends over time. This part of the report describes how the United States has performed in all PISA cycles from 2000 to 2012.

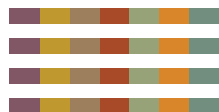
As previously discussed, the performance of the United States in PISA 2012 was *average* in reading and science among the 34 countries that currently make up the OECD and *below average* in mathematics. The results of the United States over the different PISA cycles show that student performance in all three subjects has remained broadly unchanged (Figure 2.2).

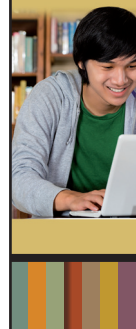
Figure 2.2 ■ **Mean performance scores for the United States in reading, mathematics and science in PISA cycles**

	PISA 2000	PISA 2003	PISA 2006	PISA 2009	PISA 2012
	Mean score	Mean score	Mean score	Mean score	Mean score
Reading	504 (7.0)	495 (3.2)		500 (3.7)	498 (3.7)
Mathematics		483 (2.9)	474 (4.0)	487 (3.6)	481 (3.6)
Science			489 (4.2)	502 (3.6)	497 (3.8)

Notes: Standard errors indicated in parentheses under the mean scores.

Shaded cells indicate that data are not available for those particular domains in the corresponding PISA cycle.





Box 2.1 **The relationship between education and economic growth: Would improved educational outcomes of students also improve the prospects of a country's future?**

During the 2010 World Economic Forum in Davos, Switzerland, the OECD released a report, *The High Cost of Low Educational Performance*. Written by Professor Eric A. Hanushek from the Hoover Institution at Stanford University and by Professor Ludger Woessmann from the Ifo Institute for Economic Research in Munich, Germany, the report uses economic modeling to estimate the relative value of cognitive skills to a country's projected economic growth. The report reflects the influence that human capital has on growth and how it can be characterized by the relationship between direct measures of cognitive skills and long-term economic development. The OECD report combines PISA results for countries with other international assessments to construct a common scale that looks at countries' performance on all of the assessments.

The report concludes that improvements in students' educational outcomes can greatly affect the skills of a nation's labor force and therefore affect the future of a nation's economy. These gains are measured by an increasing GDP over the long term. The evidence from the economic models presented in the report indicates that a majority of differences in economic growth rates across OECD countries can be explained by differences in cognitive skills and that differential skills have a very powerful and continuing impact on economic growth (OECD, 2010b).

The OECD report suggests that if countries want to invest long term in their economic growth, they must improve the quality of their education. The skills available in the labor force, and the price of those skills, determine how countries fare in the global market. Workers with higher levels of education become even more important as services and production systems become more complex. As heightened mobility of the global workforce is inevitable, the right balance is needed to encourage overall equity in societies and offer strong economic incentives to attract and retain skilled workers.

The PISA average performance score in reading for OECD countries was 493 points in 2009. If all 30 OECD countries¹ at the time the report was written were to raise their average PISA scores by only 25 points in the next 20 years, there would be a total gain of USD 115 trillion in GDP over the lifetime of the generation born in 2010 for OECD countries – in other words, by 2090. This projection assumes that it takes 20 years to implement reforms, meaning that the true impact would be felt when today's young students with greater skills become active members of the workforce.

The possible effect of improving PISA scores on GDP for the United States, Canada and the United Kingdom in a span of 20 years (2010-30)

	After bringing everyone to a basic level of 400 score points on PISA		After an increase of 25 PISA score points	After bringing each country to the Finnish performance of 546 points* on PISA	
	Value of reform (USD bn)	% of current GDP	Value of reform (USD bn)	Value of reform (USD bn)	% of current GDP
Canada	2,594	185	3,743	2,524	180
United Kingdom	6,481	272	6,374	7,326	307
United States	72,101	475	40,647	103,073	678

*546 score points represents Finland's PISA average in mathematics and science in 2000, 2003 and 2006.

Source: OECD (2010b), *The High Cost of Low Educational Performance: The Long-Run Economic Impact of Improving PISA Outcomes*, OECD Publishing, Paris.

1. When *The High Cost of Low Educational Performance: The Long-Run Economic Impact of Improving PISA Outcomes* was published, there were a total of 30 OECD member countries, as opposed to 34 today.



That would mean for the United States growth of almost USD 41 trillion in GDP from just under USD 15 trillion in GDP over the next 80 years and for the United Kingdom a USD 6 trillion increase in GDP, while Canada's GDP would increase by more than USD 3.7 trillion (OECD, 2010b).

To see the full impact of education on economic growth, however, countries must be able to absorb the newly trained and more advanced skilled workforce into the labor market; new types of jobs must be created and new technologies must be invented. Countries must use more creativity, critical thinking, problem solving and decision making with innovative methods of communication and collaboration and learn how to recognize and exploit the potential of new technologies. Students must gain the ability to live in a multi-faceted world as active and responsible citizens (OECD, 2012a).

In the United States, local and regional government agencies have increasingly adopted sectoral strategy approaches to economic development. Through these efforts, some high schools and community colleges are able to establish career-pathway models that help connect them to the economy and produce workers with the appropriate skills for jobs in the region.

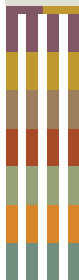
Through the School-to-Work Opportunities Act in Maryland (United States), around 350 business executives in 10 sectors were brought together to inform education policy makers about what they needed to be successful. The original project mapped out what knowledge and skills were required to develop programs around clusters of skills. For example, in Montgomery County, Maryland, which hosts the third-largest biotechnology cluster in the United States, a Cluster Advisory Board (CAB) focuses on biosciences, health science and medicine. Administrators, counselors and faculty members use the system to develop programs that extend from high school to two- and four-year colleges/universities, graduate schools, apprenticeship programs and the workplace. The cluster framework, originally developed for high schools and young people, is now being adopted by workforce investment boards and other programs serving adults (OECD, 2012a).

To find out more about how countries are preparing students for the future and the impact of education on a country's GDP, go to:

- [*The High Cost of Low Educational Performance: The Long-Run Economic Impact of Improving PISA Outcomes*](#)
- [*Better Skills, Better Jobs, Better Lives: A Strategic Approach to Skills Policies*](#)

Sources: OECD (2010b), [*The High Cost of Low Educational Performance: The Long-Run Economic Impact of Improving PISA Outcomes*](#), OECD Publishing, Paris.

OECD (2012a), [*Better Skills, Better Jobs, Better Lives: A Strategic Approach to Skills Policies*](#), OECD Publishing, Paris.





Box 2.2 **The sample of students and schools participating in PISA 2012 in the United States**

The purpose of the sampling procedures conducted as part of the main PISA studies every three years is to provide results of student performance that are statistically representative for the whole country. Therefore, the students who participate in the main PISA studies are selected to statistically “represent” the total population of 15-year-olds in a given country. In the case of the United States for PISA 2012, a total of 6,111 students from 161 public and private schools participated. The schools and students were randomly selected and weighted so that results would be representative of the education system as a whole. At each of the participating schools, approximately 35 to 42 15-year-old students were invited to take part (unless the school had fewer than 35 eligible students, in which case all students were selected). Unlike other federal systems such as Canada and the United Kingdom, the United States did not measure the performance of states individually in PISA 2012, except for three states: Connecticut, Florida and Massachusetts. These states participated to receive state-level results in addition to the country-level results for the United States.

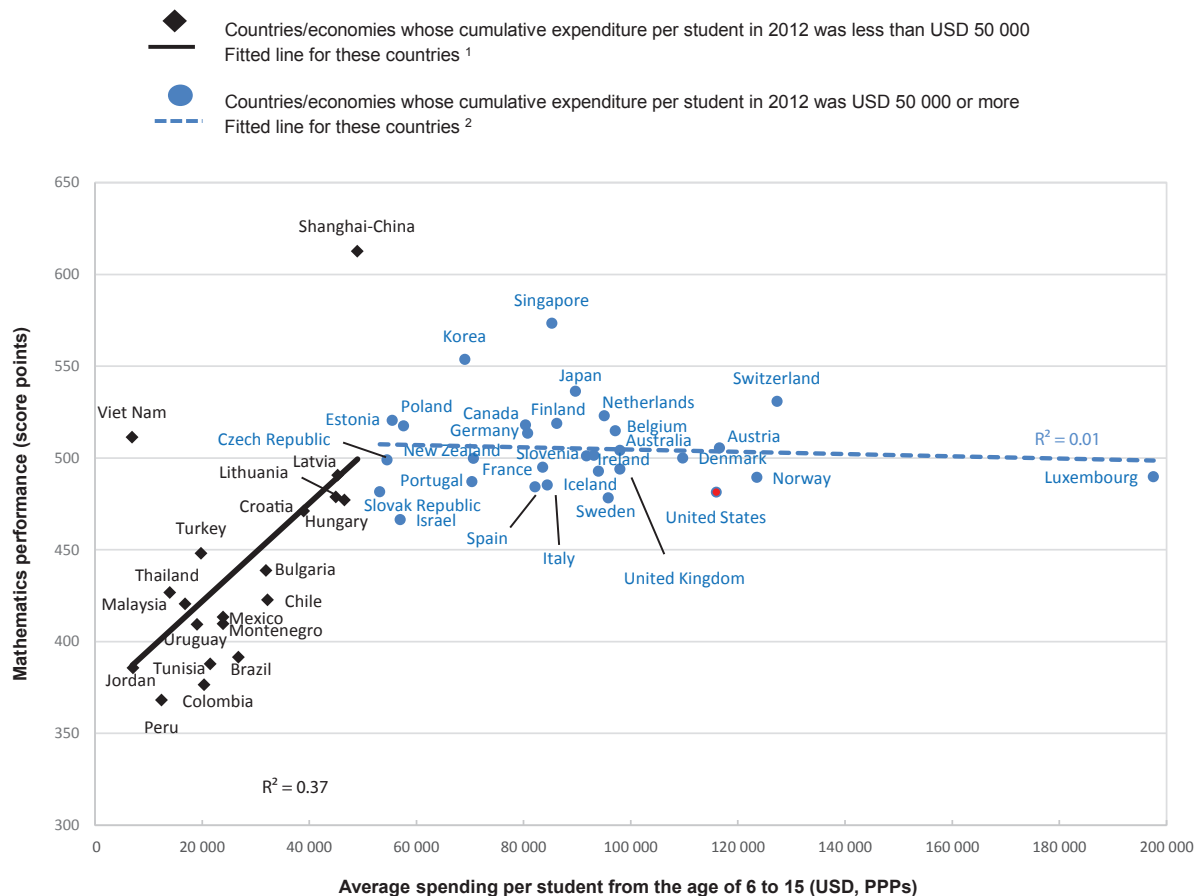
In science, however, the United States has seen gains since 2006 and is now performing at the OECD average. These gains were driven mainly by improvements at the bottom of the performance distribution: between 2006 and 2009, there was a 6% decrease in students performing below Level 2 proficiency, and no change between 2009 and 2012. At the top end of the performance scale (proficiency Levels 5 and 6), however, performance stayed relatively unchanged.

Expenditure per student explains 17% of the variation in student performance across OECD countries. PISA results show, however, that it is not just the volume of resources that matters, but how well countries succeed in directing the money where it can make the most difference. While the United States spends around USD 115,000 on education per student between the ages of 6 and 15 (surpassed only by Austria, Luxembourg, Norway and Switzerland), countries such as Canada, Germany and Korea achieve significantly better student outcomes with spending between USD 65,000 and 81,000 per student and the Slovak Republic, which performs around the same level as the United States, spends only USD 53,000 per student (see Figure 2.3 on spending per student).

Across OECD countries, average mathematics performance has remained largely unchanged between PISA 2003 and PISA 2012. Yet some countries have seen marked improvements in learning outcomes. In Germany the average performance in reading increased by 11 points from 2003 to 2012, and in Poland and Portugal the performance increased by more than 20 points in the same period. In these countries, the improvements in learning outcomes are the result of wide-ranging reforms in the education systems. The trends shown by PISA results indicate, therefore, that improvement is possible in a relatively short period of time – even at the system level.

PISA results therefore provide two key insights. One is that it is not just the amount of resources that can produce quality and equity across education systems, but how those resources are put to use. The second is that improvement is possible in a reasonable time frame, as shown by the improvement trajectories of some education systems across the world. To help put these and other insights from PISA into perspective, throughout this report the reader will find text boxes and references to OECD reports, research and resources (including videos) that analyze and provide examples of the education reforms in these and in other countries that are the highest-performing or that have seen rapid improvements in learning outcomes.

Figure 2.3 ■ Spending per student from the age of 6 to 15 and mathematics performance in PISA 2012



Note: Only countries and economies with available data are shown.

1. A significant relationship ($p < 0.10$) is shown by the solid line.

2. A non-significant relationship ($p > 0.10$) is shown by the dotted line.

Source: OECD, PISA 2012 Database, Tables I.2.3a and IV.3.1.

What students at your school know and can do in reading

This section takes a closer look at your school's performance results in reading. How well do students at your school read? Can they find what they need in written texts, interpret and use the information and reflect upon it critically in relation to their own experiences and understanding? And how do they compare to students across the United States who participated in PISA 2012?

The reading part of the *OECD Test for Schools* focuses on students' ability to use written information in situations that they encounter in life. Like in the main PISA study, *reading literacy* in the *OECD Test for Schools* is defined as

understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, to develop one's knowledge and potential, and to participate in society.

This definition goes beyond the traditional notion of the decoding of information and literal interpretation of what is written, toward more applied tasks. To provide a better understanding of the type of tasks used to assess student competencies, a selection of sample tasks can be found in Annex C.



Figure 2.4 ■ The six levels of reading proficiency in PISA

Level	Lower score limit on PISA scale	What students can do at this level of proficiency
6	698	Students at proficiency Level 6 are highly skilled readers. They can conduct fine-grained analyses of texts, which require detailed comprehension of both explicit information and unstated implications, and they can reflect on and evaluate what they read at a more general level. Students at this level have successfully completed most of the tasks presented to them in the reading assessment, demonstrating that they are capable of dealing with many different types of reading material. Hence, they are diversified readers who can assimilate information from unfamiliar content areas presented in atypical formats, as well as being able to engage with more familiar content with typical structures and text features. Another characteristic of the most highly developed readers is that they can overcome preconceptions in the face of new information, even when that information is contrary to expectations. Students at this level are capable of recognizing what is provided in a text, both conspicuous and more subtle information, while being able to apply a critical perspective to it, drawing on sophisticated understanding beyond the text.
5	626	Students at proficiency Level 5 can handle texts that are unfamiliar in either form or content. They can find information in such texts, demonstrate detailed understanding and infer which information is relevant to the task. They are also able to critically evaluate such texts and build hypotheses about them, drawing on specialized knowledge and accommodating concepts that might be contrary to expectations. An inspection of the kinds of tasks students at Level 5 are capable of suggests that those who get to this level and Level 6 can be regarded as potential “world-class” knowledge workers of tomorrow.
4	553	Students at proficiency Level 4 are capable of difficult reading tasks such as locating embedded information, construing meaning from linguistic nuances and critically evaluating a text. Tasks at this level that involve retrieving information require the reader to locate and organize several pieces of embedded information. Some tasks at this level require interpreting the meaning of nuances in a section of text by taking into account the text as a whole. Other interpretative tasks require understanding and applying categories in an unfamiliar context. Reflective tasks at this level require readers to use formal or public knowledge to hypothesize about or critically evaluate a text. Readers must demonstrate an accurate understanding of long or complex texts whose content or form might be unfamiliar.
3	480	Students at proficiency Level 3 are capable of reading tasks of moderate complexity, such as locating multiple pieces of information, making links between different parts of a text and relating it to familiar everyday knowledge. Tasks at this level require the reader to locate, and in some cases recognize the relationship between, several pieces of information that must meet multiple conditions. Interpretative tasks at this level require the reader to integrate several parts of a text in order to identify a main idea, understand a relationship or construe the meaning of a word or phrase. They need to take into account many features in comparing, contrasting or categorizing. The required information might not be prominent or there may be too much competing information, or there might be other obstacles in the text, such as ideas that are contrary to expectation or that are negatively worded. Reflective tasks at this level might require connections, comparisons and explanations, or they might require the reader to evaluate a feature of the text. Some reflective tasks require readers to demonstrate a fine understanding of the text in relation to everyday knowledge. Other tasks do not require detailed text comprehension but require the reader to draw upon less common knowledge.
2	407	Students at proficiency Level 2 are capable of tasks that require the reader to locate one or more pieces of information, which might need to be inferred and might need to meet several conditions. Other tasks at this level require recognizing the main idea in a text, understanding relationships or construing meaning within a limited part of the text when the information is not prominent and the reader must make low-level inferences. Tasks at this level may involve comparisons or contrasts based on a single feature in the text. Typical reflective tasks require readers to make a comparison or several connections between the text and outside knowledge by drawing on personal experience and attitudes. PISA considers Level 2 a baseline level of proficiency at which students begin to demonstrate the reading skills and competencies that will allow them to participate effectively and productively in life as they continue their studies and as they enter into the labor force and become members of society.
1	335	Students at proficiency Level 1 are capable of locating pieces of explicitly stated information that are rather prominent in the text, recognizing a main idea in a text about a familiar topic and recognizing the connection between information in such a text and their everyday experience. Typically the required information in texts at this level is prominent and there is little, if any, competing information. The reader is explicitly directed to consider relevant factors in the task and in the text.



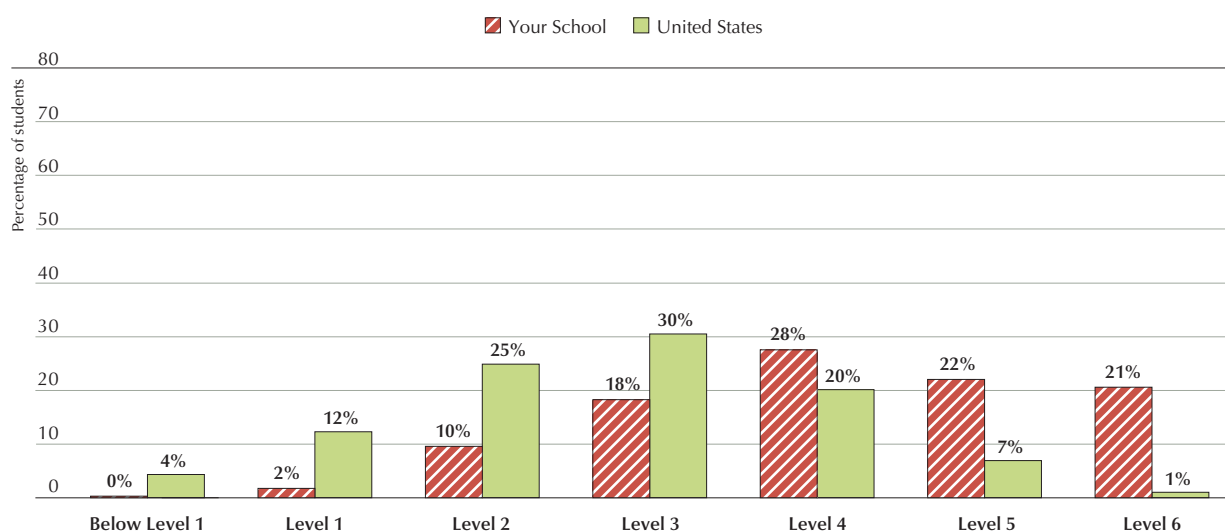
Depending on the tasks that students are able to successfully respond to, students can be grouped into levels of reading proficiency. Figure 2.4 presents short descriptions of what students are expected to know and be able to do at each proficiency level. The lowest score limit on the PISA reading scale is presented for each level. Students with a score between 480 and 552, for example, are proficient at Level 3. Students with a score of 698 or above are proficient at Level 6, while students with a score below 335 do not reach Level 1. Students below Level 1 are not necessarily considered illiterate, but based on the test used in the pilot, there is insufficient information on which to base a description of these students' reading proficiency. **Level 2** is considered the baseline level of reading proficiency. At this level students begin to demonstrate reading competencies that will enable them to participate effectively and productively in life. You can find a description of the assessment frameworks in the annexes to this report.

How students at your school perform in terms of proficiency levels in reading

Figure 2.5 shows the distribution of students at your school in the six proficiency levels in reading compared with students in the United States in PISA 2012. If the bars are striped, the distribution of students at your school is statistically different from that of the United States. If the bars are solid, the distribution is not statistically different.

Only 8% of students in the United States perform at or above Level 5 in reading, while Shanghai-China, a top educational system, has twice as many of the highest-performing students in reading. The kinds of tasks that students at Levels 5 and 6 are capable of suggest that those who get to Level 5 or above can be regarded as potential "world-class" knowledge workers of tomorrow.

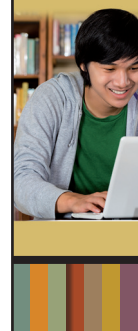
Figure 2.5 ■ **How proficient are students at your school in reading compared with students in the United States in PISA 2012**



Note: Striped bars are an indication that the distribution of students in proficiency levels at your school is statistically significantly different from the distribution of students in the United States. Solid bars are an indication that the distribution of students in proficiency levels at your school is not statistically significantly different from the distribution of students in the United States.

Source: OECD.

Seventeen percent of 15-year-olds in the United States do not reach the baseline Level 2 of reading proficiency. As described earlier, Level 2 is the level at which students begin to demonstrate reading competencies that will enable them to participate effectively and productively as continuing students, as workers and as citizens. In the highest-performing countries such as Korea and Singapore, the proportion of poor performers is less than 10%.



Box 2.3 **The link between reading performance and success in adult life**

The ability to comprehend and interpret a text is not only a necessary foundation for all subject areas within an educational setting, but it is also essential for successful participation in most areas of adult life. Today, we recognize that it is not only the quantity of education that matters, but also the quality. Learning in school is not enough: students must be taught how to continue as lifelong learners after having left the halls of educational institutions. In order to meet this goal, students must be ready to cope with the variety of written information they will encounter throughout their lives and must be able to apply that knowledge in everyday settings as they make the transition to adult life (OECD, 2002).

Canada launched the “Youth in Transition Survey” in 2000, which interviewed 30,000 Canadian students who had participated in PISA 2000 every two years from ages 15 to 25. The survey shows that students in the bottom quartile of PISA reading scores were much more likely to drop out of secondary school and less likely to continue beyond grade 12 than those in the top quartile. High achievers were more likely to continue with education at age 21 and did not enter the workforce right away. Students at the top PISA levels of reading proficiency (Levels 5 and 6) were 20 times more likely to go to university than those at or below Level 1. If students who were in the top quartile did work, they were more likely to return to education later. Students who scored below Level 2 faced a disproportionately higher risk of poor participation in post-secondary education or low labor-market outcomes at age 19, and even worse outcomes at age 21. Also, women who had obtained high reading scores at age 15 earned 12% more than those with low scores. However, the relationship was weaker for men (OECD, 2010e).

Expanding students’ knowledge of occupational choices and increasing their occupational aspirations may help them to become more motivated learners. Educational benefits can be reinforced by making literature available and other cultural possessions accessible to students, especially those from poor families in low- and middle-income neighborhoods. In addition, students who talk with their parents about social and cultural issues tend to be better readers. How will we support parents, particularly those with limited educational attainment, to facilitate their interaction with their children and with their children’s schools?

Another interesting find from PISA 2009 results is that the difference between students who have higher scores on the combined reading literacy scale and those with lower scores is how they approach reading. Those who spend more time reading for pleasure tend to read a great variety of materials and have a more positive attitude toward reading. They tend to be better readers, regardless of family background (OECD, 2010h).

For students to become better readers, and overall learners, teachers can help promote parents’ involvement at home. In addition, parent-teacher partnerships need not be restricted to school-based activities. When teachers have trusting relationships with parents, they can share their knowledge about their students’ needs and preferences. Teachers can also support and inform parents on the best way to engage with their children and can discuss matters with students directly when parents face constraints that make regular involvement with their children difficult (OECD, 2012e).

Teachers can develop programs to cultivate the desire to read. Programs such as “Drop Everything and Read” in the United States show children that reading for pleasure is a valuable activity.

...



Teachers can encourage both students and parents to use libraries, support book clubs among students and among parents and establish periods dedicated to reading during the school day. As a result, parents should begin to see that reading to their young children is as essential as feeding and clothing them, and children grow up with the deeply ingrained sense that reading is both a valuable pursuit and a pleasure (OECD, 2012e).

The workplace of the future will expect employees to obtain and organize information on the one hand and interpret and analyze the information on the other. Parents, teachers and communities can dramatically affect how much children read and help nurture young adults who continue to develop their knowledge base and their ability to think critically long after they have left school.

To find out more about the effects of reading on Canadian students' performance and other ways teachers and parents can encourage students to read, go to:

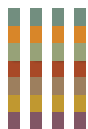
- [*Pathways to Success: How Knowledge and Skills at Age 15 Shape Future Lives in Canada*](#)
- [*Let's Read Them a Story! The Parent Factor in Education*](#)

Sources: OECD (2002), [*Reading for Change: Performance and Engagement across Countries: Results from PISA 2000*](#), OECD Publishing, Paris.

OECD (2010e), [*Pathways to Success: How Knowledge and Skills at Age 15 Shape Future Lives in Canada*](#), OECD Publishing, Paris.

OECD (2010h), [*PISA 2009 Results: Learning to Learn: Student Engagement, Strategies and Practices \(Volume III\)*](#), PISA, OECD Publishing, Paris.

OECD (2012e), [*Let's Read Them a Story! The Parent Factor in Education*](#), OECD Publishing, Paris.



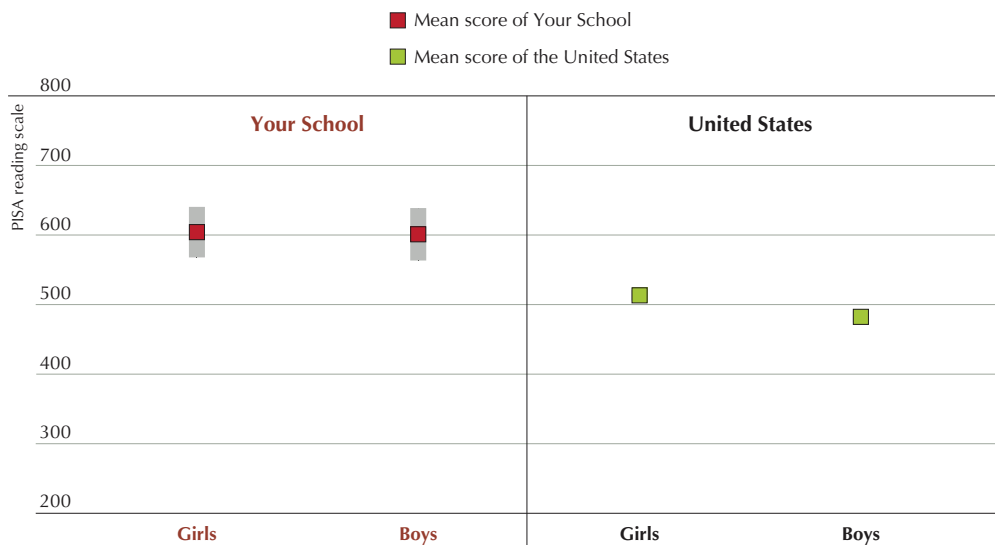
A Canadian study that followed students who were assessed by PISA in 2000 and later in life has shown that students scoring below Level 2 face high risks of not completing post-secondary education and of having difficulties in the labor market at age 19, and even more so at age 21. For example, more than 60% of students who performed below Level 2 in PISA 2000 had not gone on to any post-school education by age 21 (see Box 2.3).

How girls and boys perform in reading

PISA shows that in some subjects girls tend to perform better than boys, while in other subjects boys tend to perform better. It is useful therefore to look at the performance of girls and boys at your school to see if there are significant differences between them or between the tendency at your school and for the students who participated in PISA 2012. Large gender differences can indicate a need to consider whether instruction in the classroom is equally targeted toward all students and whether specific measures are necessary to improve performance among specific groups of students.

Figure 2.6 shows how girls and boys perform in reading at your school compared with girls and boys across the United States in PISA 2012. The left-hand side of the figure shows the results for your school, while the right-hand side shows the results for the United States in PISA 2012.

Figure 2.6 ■ How girls and boys perform in reading at your school and in the United States in PISA 2012



Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance score would fall within this confidence interval. Source: OECD.

PISA results show that reading is the subject with the largest difference in average scores between boys and girls. In every country that participated in PISA 2012, from Albania to Singapore to the Russian Federation, **girls on average read better than boys**. In the United States, the average gender difference in reading is 31 points in favor of girls. Yet the gender gap in other countries can be even larger. On average across OECD countries, girls outperform boys by 38 points. In Canada the gender gap is close to the OECD average, with girls outperforming boys by 38 points. In the United Kingdom the gender difference is less, at 25 points.

What students at your school know and can do in mathematics

The following section will take a closer look at your school's results in mathematics. The *OECD Test for Schools* measures mathematics in terms of students' capacity to formulate, employ and interpret mathematics in a variety of contexts. This includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena.

Similar to the international PISA assessment, the test consists of tasks that allow the students to demonstrate their ability to analyze and reason as they solve and interpret mathematical problems that involve quantitative, spatial, probabilistic or other mathematical concepts. To provide a better understanding of the type of tasks used to assess students' knowledge and skills in mathematics, a selection of sample tasks has been included in Annex C.

Depending on the tasks that students are able to respond to successfully, students can be grouped into different levels of mathematics proficiency. Figure 2.7 presents short descriptions of what students are expected to know and be able to do at each level of mathematics proficiency. The lowest score limit on the PISA scale is presented for each level. **Level 2** represents a baseline level of mathematics proficiency at which students begin to demonstrate the kinds of skills that enable them to use mathematics in ways that are considered fundamental for their future development. Students with a score between 482 and 544 are



proficient at Level 3. Students with a score of 669 and above are proficient at Level 6, while students with a score below 358 do not reach Level 1. Students below Level 1 usually do not succeed at the most basic mathematical tasks that PISA and the *OECD Test for Schools* measure. Their pattern of answers is such that they would be expected to solve fewer than half of the tasks in a test made up of questions drawn solely from Level 1.



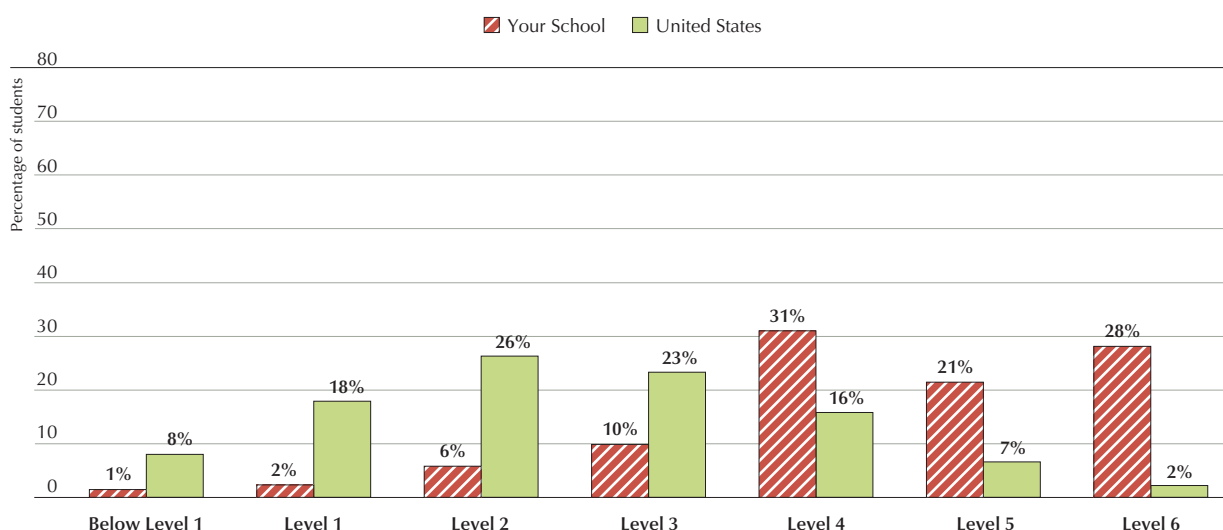
Figure 2.7 ■ The six levels of mathematics proficiency in PISA

Level	Lower score limit on PISA scale	What students can do at this level of proficiency
6	669	Students at proficiency Level 6 can conceptualize, generalize and utilize information based on their investigations and modeling of complex problems. They can link different information sources and representations and flexibly translate between them. Students at this level are capable of advanced mathematical thinking and reasoning. They can apply this insight and understanding along with a mastery of symbolic and formal mathematical operations and relationships to develop new approaches and strategies for attacking novel situations. Students at this level can formulate and precisely communicate their actions and reflections regarding their findings, interpretations and arguments and the appropriateness of these to the original situations.
5	607	Students at proficiency Level 5 can develop and work with models for complex situations, identifying constraints and specifying assumptions. They can select, compare and evaluate appropriate problem-solving strategies for dealing with complex problems related to these models. Students at this level can work strategically using broad, well-developed thinking and reasoning skills, appropriately linked representations, symbolic and formal characterizations and insight pertaining to these situations. They can reflect on their actions and communicate their interpretations and reasoning.
4	545	Students at proficiency Level 4 can work effectively with explicit models for complex, concrete situations that might involve constraints or call for making assumptions. They can select and integrate different representations, including symbolic ones, linking them directly to aspects of real-world situations. Students at this level can use well-developed skills and reason flexibly, with some insight, in these contexts. They can construct and communicate explanations and arguments based on their interpretations, arguments and actions.
3	482	Students at proficiency Level 3 can execute clearly described procedures, including those that require sequential decisions. They can select and apply simple problem-solving strategies. Students at this level can interpret and use representations based on different information sources and reason directly from them. They can develop short communications reporting their interpretations, results and reasoning.
2	420	Students at proficiency Level 2 can interpret and recognize situations in contexts that require no more than direct inference. They can extract relevant information from a single source and make use of a single representational mode. Students at this level can employ basic algorithms, formulae, procedures or conventions. They are capable of direct reasoning and literal interpretations of the results. PISA considers Level 2 a baseline level of mathematics proficiency at which students begin to demonstrate the kind of skills that enable them to use mathematics in ways that are considered fundamental for their future development.
1	358	Students at proficiency Level 1 can answer questions involving familiar contexts where all relevant information is present and the questions are clearly defined. They are able to identify information and to carry out routine procedures according to direct instructions in explicit situations. They can perform actions that are obvious and follow immediately from the given stimuli.

How students at your school perform in terms of proficiency levels in mathematics

Figure 2.8 shows the distribution of students at your school across the six proficiency levels in mathematics compared with students in the United States in PISA 2012. As before, if the bars are striped, the distribution of students at your school is statistically different from that of the United States. If the bars are solid, the distribution is not statistically different.

Figure 2.8 ■ How proficient are students at your school in mathematics compared with students in the United States in PISA 2012



Note: Striped bars are an indication that the distribution of students in proficiency levels at your school is statistically significantly different from the distribution of students in the United States. Solid bars are an indication that the distribution of students in proficiency levels at your school is not statistically significantly different from the distribution of students in the United States.

Source: OECD.

Only 1 in 4 students in the United States (25%) scores at or above proficiency Level 4 in mathematics – the level at which students can solve problems that involve visual and spatial reasoning – which is comparable to the OECD average of 30%, while in the highest-performing OECD countries such as Finland and Korea, around 40%, or more, of students perform at Level 4 or higher, and in Shanghai-China more than half of students perform at Level 5 or higher. In the lowest-performing OECD countries in mathematics – Chile and Mexico – less than 5% of students reach Level 5 or higher.

At the other end of the scale, 26% of students in the United States do not reach the baseline Level 2 in mathematics. Among these, 8% do not reach Level 1, while 18% reach Level 1 but not Level 2.

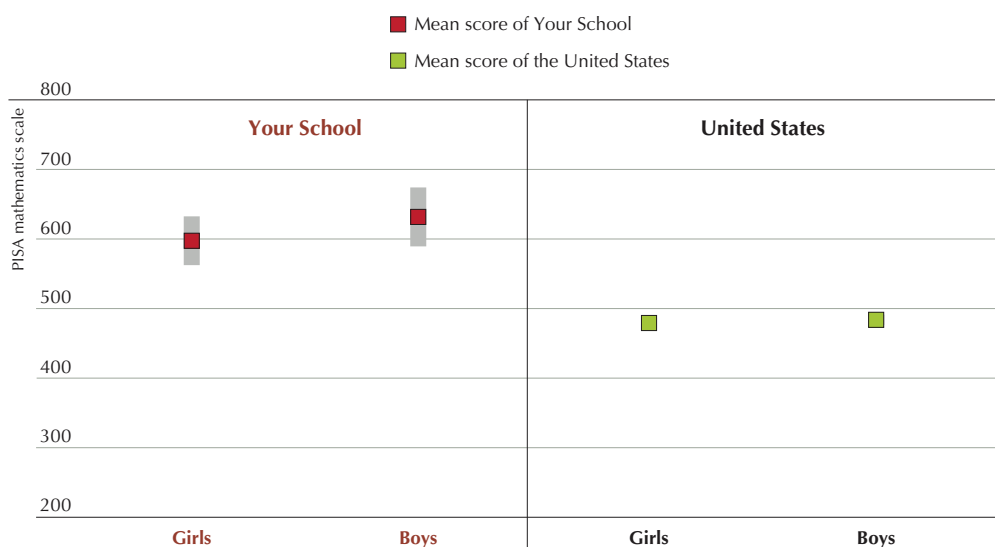
How girls and boys perform in mathematics

Figure 2.9 shows how girls and boys perform in mathematics at your school compared with girls and boys across the United States in PISA 2012.

In most countries **boys on average perform better than girls in mathematics**. However, in the United States the gender gap is relatively small and not statistically significant compared with the OECD average, which shows an 11-point difference in favor of boys.



Figure 2.9 ■ How girls and boys perform in mathematics at your school and in the United States in PISA 2012



Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance scores would fall within this confidence interval. Source: OECD.

What students at your school know and can do in science

This section of the report will take a closer look at your school's results in science in order to provide information to respond to the following questions: To what extent have students at your school learned fundamental scientific concepts and theories? And have they learned to solve real-life problems involving science?

Unlike many traditional assessments of student performance in science, PISA and the *OECD Test for Schools* are not limited to measuring students' mastery of specific science content. Rather, they measure the capacity of students to identify scientific issues, explain phenomena scientifically and use scientific evidence as the students encounter, interpret, solve and make decisions in life situations involving science and technology.

To provide a better understanding of the type of tasks used to assess students' science competencies, a selection of sample tasks has been included in Annex C. See also [Take the Test: Sample Questions from OECD's PISA Assessments](#).

As with reading and mathematics, depending on the science tasks that students are able to respond to successfully, students can be grouped into different levels of science proficiency. Figure 2.10 presents short descriptions of what students are expected to know and be able to do at each level of science proficiency. The lowest score limit on the PISA scale is presented for each level. **Level 2** has been established as the baseline level of science proficiency. It defines the level of achievement at which students begin to demonstrate the science competencies that will enable them to participate actively in life situations related to science and technology. Students with a score between 484 and 558 are proficient at Level 3. Students with a score of 708 and above are proficient at Level 6, while students with a score below 335 do not reach Level 1. Students below Level 1 usually do not succeed at the most basic levels of science that PISA and the *OECD Test for Schools* measure. Their pattern of answers is such that they would be expected to solve fewer than half of the tasks in a test made up of questions drawn solely from Level 1.



Figure 2.10 ■ The six levels of science proficiency in PISA

Level	Lower score limit on PISA scale	What students can do at this level of proficiency
6	708	At proficiency Level 6, students can consistently identify, explain and apply scientific knowledge and knowledge about science in a variety of complex life situations. They can link different information sources and explanations and use evidence from those sources to justify decisions. They clearly and consistently demonstrate advanced scientific thinking and reasoning, and they demonstrate willingness to use their scientific understanding in support of solutions to unfamiliar scientific and technological situations. Students at this level can use scientific knowledge and develop arguments in support of recommendations and decisions that center on personal, social or global situations.
5	633	At proficiency Level 5, students can identify the scientific components of many complex life situations; apply both scientific concepts and knowledge about science to these situations; and can compare, select and evaluate appropriate scientific evidence for responding to life situations. Students at this level can use well-developed inquiry abilities, link knowledge appropriately and bring critical insights to situations. They can construct explanations based on evidence and arguments based on their critical analysis.
4	559	At proficiency Level 4, students can work effectively with situations and issues that might involve explicit phenomena requiring them to make inferences about the role of science or technology. They can select and integrate explanations from different disciplines of science or technology and link them directly to aspects of life situations. Students at this level can reflect on their actions and can communicate decisions using scientific knowledge and evidence.
3	484	At proficiency Level 3, students can identify clearly described scientific issues in a range of contexts. They can select facts and knowledge to explain phenomena and apply simple models or inquiry strategies. Students at this level can interpret and use scientific concepts from different disciplines and apply them directly. They can develop short statements using facts and make decisions based on scientific knowledge.
2	409	At proficiency Level 2, students have adequate scientific knowledge to provide possible explanations in familiar contexts or draw conclusions based on simple investigations. They are capable of direct reasoning and making literal interpretations of the results of scientific inquiry or technological problem solving. PISA considers Level 2 a baseline level of proficiency at which students begin to demonstrate the science competencies that will enable them to participate actively in life situations related to science and technology.
1	335	At proficiency Level 1, students have such a limited scientific knowledge that it can only be applied to a few familiar situations. They can present scientific explanations that are obvious and follow explicitly from given evidence.

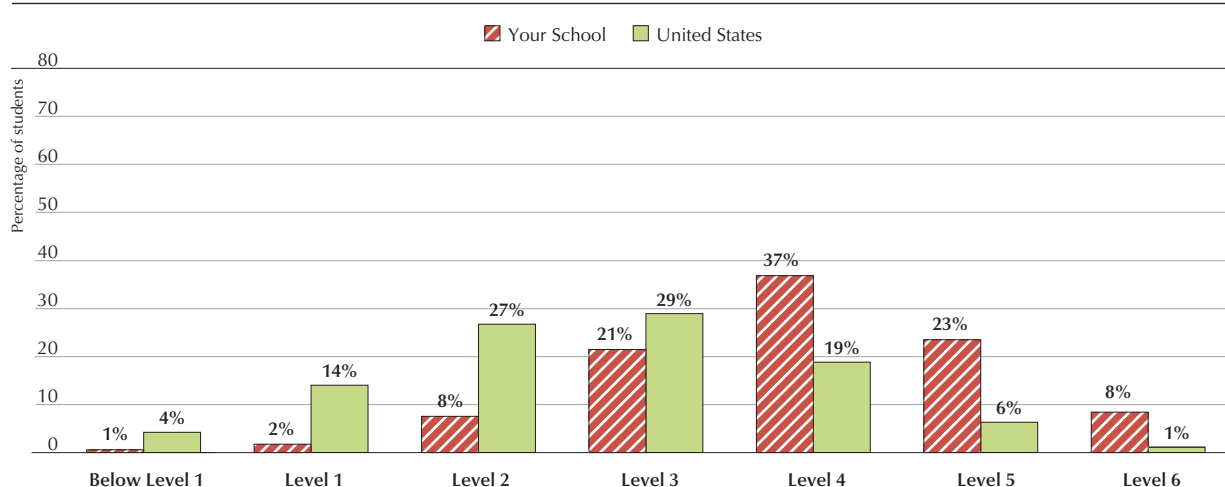


How students at your school perform in terms of proficiency levels in science

Figure 2.11 shows the distribution of students at your school across the six proficiency levels in science compared with students in the United States in PISA 2012. As with similar figures for reading and mathematics, if the bars are striped, the distribution of students at your school is statistically different from that of the United States. If the bars are solid, the distribution is not statistically different.

In the United States, 26% of students perform above Level 4 on the science scale, which is comparable to the OECD average, at 29%. Level 4 proficiency consists of students' being able to "select and integrate explanations from different disciplines of science or technology" and "link those explanations directly to life situations." In Japan, almost half of all students perform at Level 4 or above in science, while in Mexico, only 2% of students perform at or above Level 4. Similarly to the OECD average, 18% of United States students on average score below Level 2. Level 2 is the proficiency level at which students begin to provide probable explanations in contexts that are familiar using a sufficient amount of scientific knowledge. In better-performing education systems, very few students perform below this baseline Level 2: in Finland, only 8% of students perform below Level 2, and in Shanghai-China, only 3%.

Figure 2.11 ■ How proficient are students at your school in science compared with students in the United States in PISA 2012



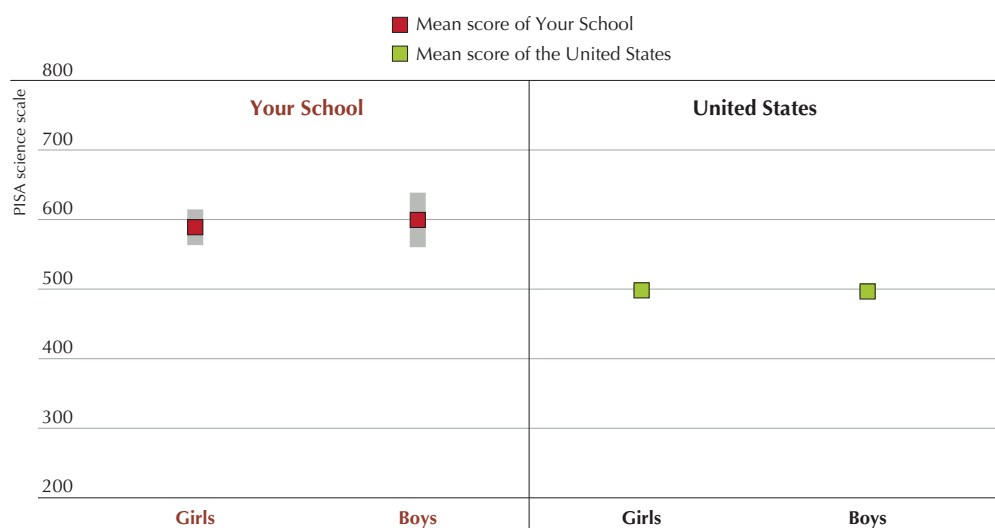
Note: Striped bars are an indication that the distribution of students in proficiency levels at your school is statistically significantly different from the distribution of students in the United States. Solid bars are an indication that the distribution of students in proficiency levels at your school is not statistically significantly different from the distribution of students in the United States.

Source: OECD.

How girls and boys perform in science

Figure 2.12 shows how girls and boys perform in science at your school compared with girls and boys across the United States in PISA 2012.

Figure 2.12 ■ How girls and boys perform in science at your school and in the United States in PISA 2012



Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance scores would fall within this confidence interval.

Source: OECD.





Student Engagement and the Learning Environment at Your School in an International Perspective

Over the years, PISA results have shown that a strong learning environment and confident, engaged and motivated students are factors that consistently contribute to better learning outcomes. Based on students' responses to a contextual questionnaire that was part of the assessment, this section places the learning environment at your school in the context of other schools in your country. It then describes how students' reading habits and awareness of effective learning strategies are related to improved reading skills. It concludes by describing how confident and motivated students at your school are in learning mathematics and science compared with other students in your country.



When reviewing performance results for your school, it is important to also consider the learning environment as it can enhance or hinder student learning outcomes. Is the climate at your school conducive to learning? To what extent are students' skills in science and mathematics related to their motivation and belief in their capacity to solve difficult tasks? How motivated are students at your school compared with those of other schools? This section seeks to answer these and other questions related to the learning environment and the students' engagement with learning. It will compare your school with others in the United States and set the results in the context of results from the highest-performing countries around the world.

Findings in this section of the report are based on responses to the contextual questionnaire that students completed as part of the *OECD Test for Schools* (based on PISA). Students around the world have responded to the same questions as part of the international PISA studies in 2012 and previous years.

Responses reported by students at your school are compared with those of other students in your own country, not internationally. Students in different schools and in different countries might not apply the same criteria when assessing the learning environment. In addition, students might also consider some questions from the perspective of their experiences in other classes or schools than the one they were attending at the time of the assessment.

THE LEARNING ENVIRONMENT AT YOUR SCHOOL AND OTHER SCHOOLS IN THE UNITED STATES

PISA shows that a strong learning environment at the school is consistently and robustly associated with better student performance when comparing students' performance within the country. Looking at school systems across the world, students tend to perform better when classrooms are well disciplined and relations between students and teachers are amiable and supportive.

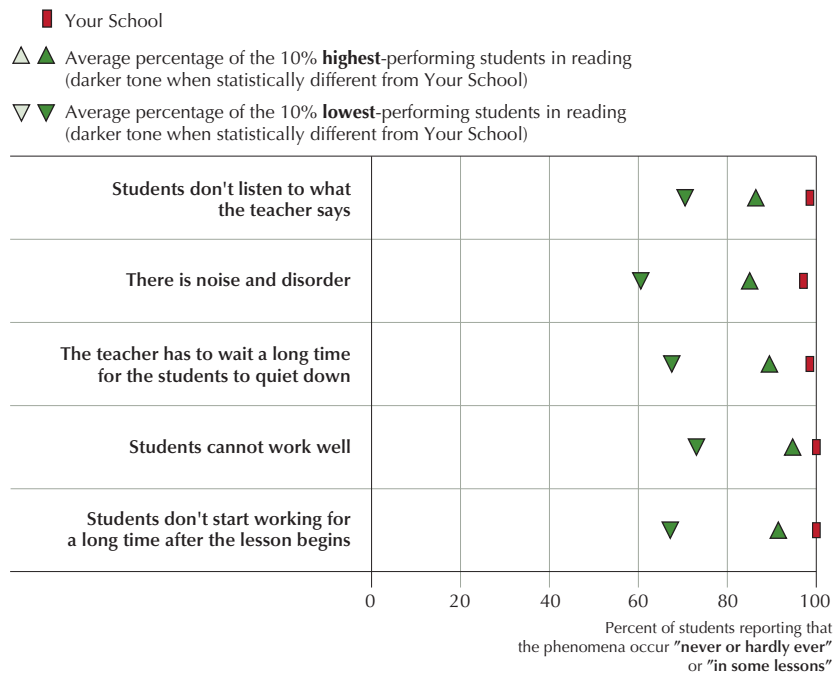
Disciplinary climate

Figure 3.1 shows how students at your school responded to five questions on the disciplinary climate in English class compared with the highest- and lowest-performing students in your country who participated in PISA 2009, when reading was the main domain. The figure shows the percentage of students who reported *occasional* or *next-to-never* interruptions in reading class at your school and among the 10% highest- and lowest-performing students in your country from PISA 2009. The occurrences include how often students don't listen to what the teacher says, there is noise and disorder, the teacher has to wait a long time for students to quiet down, students cannot work well or students don't start working for a long time after the lesson begins.

When comparing the disciplinary climate at your school with the disciplinary climate that the highest- and lowest-performing students experience, as shown in Figure 3.1, it is useful to note that the darkness of the triangular markers indicates whether the responses for students at your school are on average statistically different from those of the highest- or lowest-performing students in the United States. In short, darker-toned markers indicate statistical significance so the results for your school can be considered to be significantly different. If for example the marker for the lowest-performing students in the United States is in a darker tone, but the marker for the highest-performing students is not, then students at your school have answered the question statistically differently from the lowest-performing students, but not statistically differently from the highest-performing students in the United States.

The majority of students in the United States enjoy orderly classrooms in their English lessons. Around 8 out of 10 report that they never or only in some lessons think that students don't start working for a long time after the lesson begins or that noise never or only in some lessons affects learning. As Figure 3.1 shows, however, not all students experience the same level of order in the classrooms. In general, high-performing students have a more positive view of the disciplinary climate than low-performing students.

Figure 3.1 ■ **Disciplinary climate in English lessons at your school and among the highest- and lowest-performing students in the United States in PISA 2009**



Source: OECD.

While 9 out of 10 of the highest-performing students report that the teachers rarely have to wait a long time for the students to quiet down, only 7 out of 10 of the lowest-performing students have a similarly positive experience in their English classes.

PISA has found that this relationship between disciplinary climate and performance goes beyond the impact of social background. While schools with disciplined classrooms tend to have more students from advantaged socioeconomic backgrounds who also generally perform better, part of the correlation between disciplinary climate and performance is unrelated to socioeconomic background.

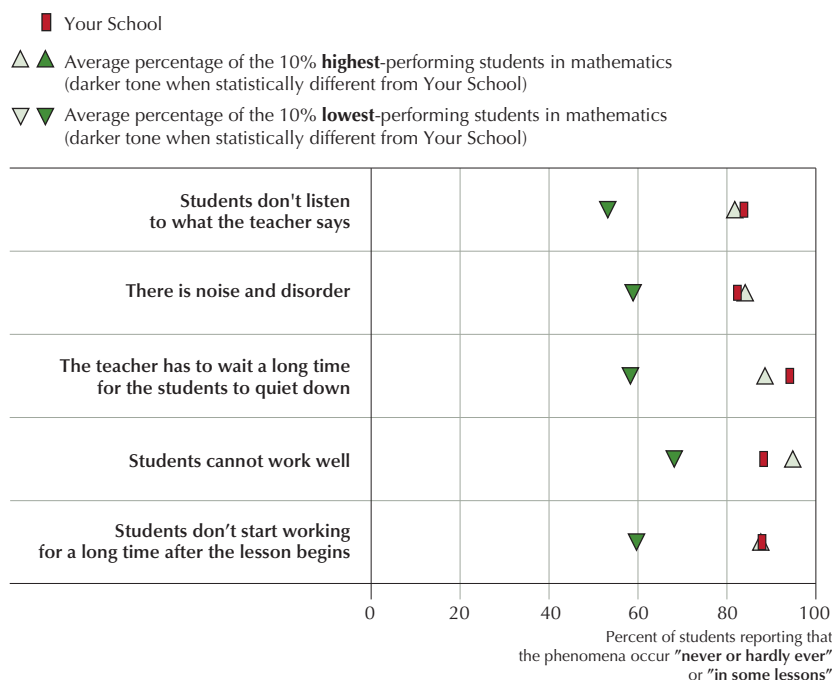
In Canada and the United Kingdom, student reports of the learning environment are slightly less positive than in the United States. The most positive reports on the learning environment are found in Japan and Korea. The average percentage of students in Japan reporting positively to questions on the disciplinary climate in reading lessons is around 90% on all five questions shown in Figure 3.1.

Disciplinary climate in mathematics lessons

Having looked at the disciplinary climate in English lessons, it is also worth examining the disciplinary climate in mathematics lessons. The same questions have been asked of students concerning the disciplinary climate in both subjects, so comparisons can be reasonably made between the learning environments in the two subjects at your school.

Figure 3.2 shows how students at your school responded to five questions on the disciplinary climate in mathematics compared with the highest- and lowest-performing students in your country who participated in PISA 2012. Similar to the figure on disciplinary climate in English lessons, this figure shows the percentage of students who reported *occasional* or *next-to-never* interruptions in mathematics class at your school and among the 10% highest- and lowest-performing students in the United States. The occurrences include how often there are times students don't listen to what the teacher says, there is noise and disorder, the teacher has to wait a long time for students to quiet down, students cannot work well or students don't start working for a long time after the lesson begins.

Figure 3.2 ■ **Disciplinary climate in mathematics lessons at your school and among the highest- and lowest-performing students in the United States in PISA 2012**



Source: OECD.



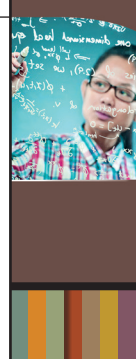
Box 3.1 **School policies, practices and resources:** **Examples of innovative learning environments from around the world**

In addition to reporting on cumulative student learning outcomes, PISA also looks at the relationship between school policies, practices and resources and student performance. PISA 2012 results show that students who perform well attend schools with similar characteristics. Local educators are increasingly interested in exploring how the learning environment at schools can be improved to enhance achievement and other learning outcomes.

The highest-performing students in PISA 2012 report that teachers allowed them time to find answers to problems themselves. Teachers of the highest-performing students tend to ask questions that challenge students. They also tend to give students enough time to think about their answers and are ready to recommend a book or author, for example. Teachers of the highest-performing students also tend to encourage students to express their opinions about a text and to help them relate the stories they read to their lives (OECD, 2013e).

Policies and practices within local education systems and even within schools, however, are not always evenly distributed. In PISA 2009 the variance between student performance between schools in both the United States and the United Kingdom is at least four times the amount of variance between schools in Finland, while in Canada it is at least three times. In addition, the variance within schools in Canada, the United Kingdom and the United States is at least two times higher than the between-school variance and higher than schools in Shanghai-China and Japan (OECD, 2013c).

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The OECD's Innovative Learning Environment Project (ILE) attempts to shed light on some of the policies and practices that have been successful in enhancing student learning outcomes. The project highlights schools throughout OECD economies that ensure learning is central by encouraging students to be engaged and involved and that reinforce the idea that learning is social and often collaborative. The learning environment at these schools also tends to be highly attuned to the motivations of learners and acutely sensitive to individual differences. The schools also use assessments that emphasize formative feedback and encourage making connections between subjects learned in school and activities outside of school. The following examples illustrate initiatives that break from the traditional mold of schooling and try new approaches to creating innovative teaching and learning environments.

Europaschule in Linz (Austria). This secondary school is a public general compulsory school and caters to all children who are entitled to move on to secondary education. It is affiliated with a university college of teacher education and serves as a center for practical in-school training of teacher-students. In addition, its entire teaching staff is involved in empirical research, constantly searching for the best teaching and learning methods. The school attaches great importance to building and maintaining international contacts.

With this view in mind, *Europaschule* emphasizes language learning, but students can also choose a science, arts or media program. Students learn in flexible, heterogeneous groups that focus on students' strengths rather than their shortcomings. Teaching methods include open teaching, during which students work according to weekly schedules. Individual feedback on student performance and behavior is given in the form of portfolios that include teachers' reports and student self-assessments. Based on the feedback, students know where their weaknesses lie and can prepare additional instruction time as needed. The aim of the approach is for students to self-manage their learning and be intrinsically motivated to learn.

John Monash Science School (Australia). This secondary school is devoted to the teaching of mathematics and science to selected high-achieving 15- to 18-year-olds. Located on one of the campuses of Monash University, the school works with university staff to develop cutting-edge, research-inspired curricula and weekly co-curricular activities, and to give students access to university-level enhancement subjects. Students are taught almost exclusively in large groups by several teachers and supported in small tutorials closely monitoring student performance. The physical environment can be flexibly configured with students able to learn in ways that best suit their own needs. All students create and implement learning plans that are individualized and are informed by their own interests and abilities. All students have an individual tablet computer that is used both for electronic communication between students and staff and as their chief learning tool, to research, problem solve, organize, document, analyze, present and create digital objects as well as to access references and resources from the university and beyond. In addition, all staff have to complete an individual Staff Development Plan that helps identify suitable professional learning opportunities for them, related to the school's strategic directions. Every teacher is able to access three hours of professional learning and curriculum development once a week while students undertake a range of co-curricular options delivered by educators from within and outside the university.

Instituto Agrícola Pascual Baburizza (Chile). This school is an agricultural VET school primarily attended by students from rural areas and from socioeconomically disadvantaged backgrounds. It provides students with a cross-disciplinary balance of general education subjects (mathematics, languages, science), agricultural subjects (horticulture, watering and cattle management) and hands-on work using sustainable agricultural practices. Learning "soft" skills, such as a sense of command, initiative and

...



honesty, is also emphasized. Teachers act as mentors by providing guidance and support for groups of 10 students. The idea of building a strong relationship between school and the workplace is important, and all the content is adjusted to the skills and needs students will face in the workplace. The national assessment in Chile shows that the overall performance of students at this school has improved in both language and mathematics by at least 20 score points within a span of 8 years, from 1998 to 2006.

The OECD is continuing to explore ways that local education systems can benchmark their performance internationally, establish improvement goals and trajectories and take steps to share and learn from other schools.

To find out more about learning environments that are breaking with tradition, go to:

- [OECD's Innovative Learning Environments](#)
- [PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices \(Volume IV\)](#)

Sources: OECD (2012c), Innovative Learning Environment Project – Papers for:

[Europaschule – Linz, Austria](#)

[John Monash Science School, Australia](#)

[Instituto Agrícola Pascual Baburizza, Chile](#)

OECD (2013c), [PISA 2012 Results: Excellence through Equity: Giving Every Student the Chance to Succeed \(Volume II\)](#), OECD Publishing, Paris.

OECD (2013e), [PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices \(Volume IV\)](#), OECD Publishing, Paris.

Because PISA focused on mathematics in the 2012 cycle, results on the disciplinary climate in mathematics for other students in the United States who participated in PISA are drawn from the 2012 cycle, whereas for reading they are drawn from PISA 2009, when reading was the main subject of assessment.

When comparing the disciplinary climate at your school with the disciplinary climate that the highest- and lowest-performing students experience, as shown in Figure 3.2, it is useful to note that the darkness of the triangular markers indicates whether the responses for students at your school are on average statistically different from those of the highest- or lowest-performing students in the United States. Darker-toned markers indicate that the results are significantly different from those of your school.

As with English lessons, the majority of students in the United States enjoy orderly classrooms in their mathematics lessons. Around 8 out of 10 students who participated in PISA 2012 reported that they *never* or *only in some lessons* think that students don't start working for a long time after the lesson begins or that noise *never* or *only in some lessons* affects learning. As Figure 3.2 shows, however, not all students show the same learning environment in the classrooms. In general, the highest-performing students had a more positive view of the disciplinary climate than the lowest-performing students. While around 9 out of 10 of the highest-performing students reported that the teachers rarely had to wait a long time for the students to quiet down, only 5 out of 10 of the lowest-performing students had a similarly positive experience in their mathematics lessons.

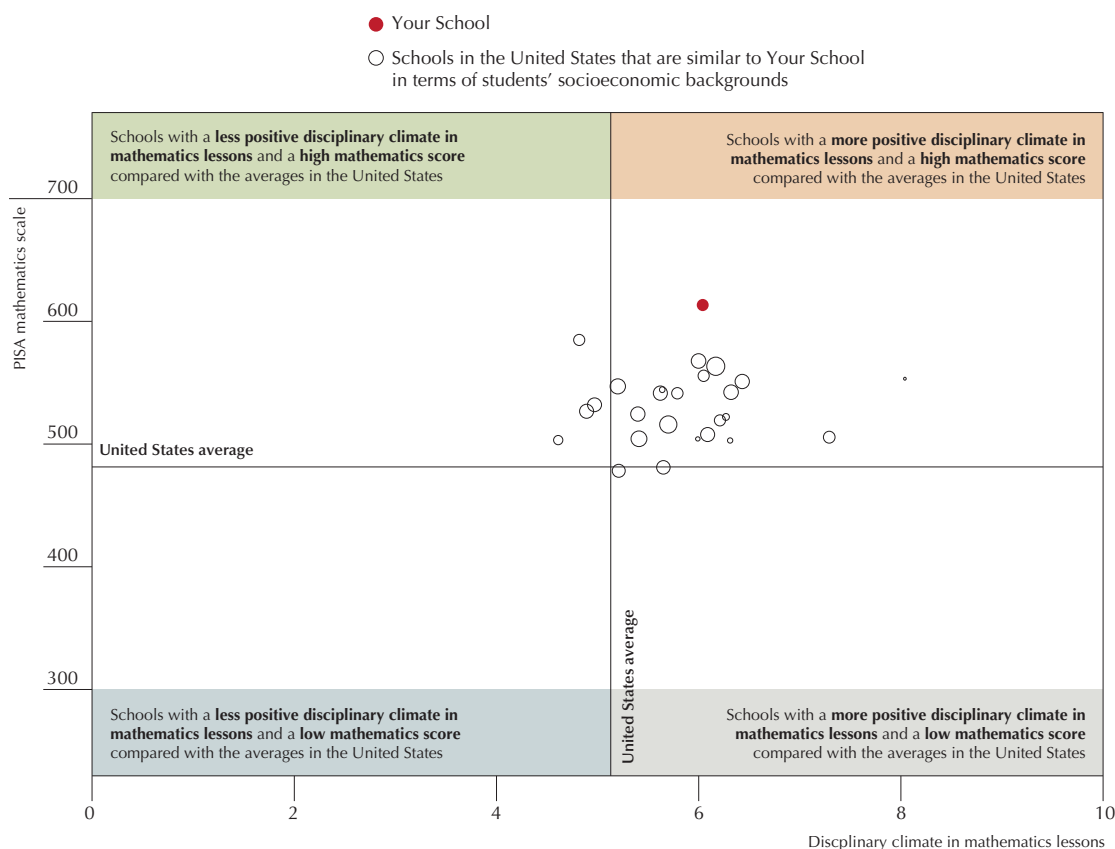
Disciplinary climate in mathematics lessons and mathematics performance

Figure 3.3 shows the disciplinary climate at your school in comparison with that of schools in the United States with a similar socioeconomic background of students from among those schools that participated in PISA 2012.

The description of the quadrants presented in Figure 3.3:

<p>This top-left quadrant is the area where schools have a less positive disciplinary climate compared with that of the country average but where mathematics performance is above the average.</p> <p>Schools in this quadrant may be able to improve learning outcomes for all students if potential issues with the disciplinary climate are addressed. Educators may consider if a mean performance estimate for the school in general could be masking lower performance for some groups of students for whom the disciplinary climate is less positive.</p>	<p>The top-right quadrant is the area where schools have a positive disciplinary climate compared with that of the country average and where mathematics performance is also above the average for the country.</p> <p>For schools in this quadrant it is useful to look at the relative position of similar schools shown in the figure. Are there other schools in the same quadrant that show an even more positive disciplinary climate and higher performance than your school? Compared to schools with a similar student intake, is your school relatively strong on disciplinary climate, on student performance, or both? The relative strengths can help foster reflection on how to further improve learning outcomes.</p>
<p>The bottom-left quadrant is the area where schools have a disciplinary climate that is less positive than the country average and where mathematics performance is below average.</p> <p>Schools in this quadrant may consider how the disciplinary climate could be improved to enhance the learning environment for all students. A strategic approach to improving students' learning outcomes might benefit from including plans to address potential issues with the disciplinary climate.</p>	<p>The bottom-right quadrant is the area where schools have a disciplinary climate that is more positive than the country average but where mathematics performance is below average.</p> <p>Schools in this quadrant have established a positive learning environment that is worth preserving in their efforts to improve the students' learning outcomes.</p>

Figure 3.3 ■ **Disciplinary climate in mathematics lessons and mathematics performance at your school compared with that of similar schools in the United States in PISA 2012**



Source: OECD.



On this figure the students' responses to the five questions shown in Figure 3.2 have been converted to an index score on a scale from 0 to 10. The *higher* the score on this scale, the more *positive* the disciplinary climate at the school. This is represented by the horizontal axis on the figure. Thus the further to the right on the figure, the more positive is the disciplinary climate at the school.

The average score in the United States is 5.13 points on the index. This is indicated in the figure by the vertical line.

Your school is represented by a red bubble in the figure, and schools in the United States with a socioeconomic background similar to that of your school are represented by hollow bubbles. The group of similar schools is the same as the group of similar schools shown in some of the bubble charts presented later in the report. The number of similar schools depends on the number of schools that participated in PISA 2012 that share the same socioeconomic characteristics as your school. If the average socioeconomic background of students at your school is very low or very high compared with that of other schools in the United States, for example, then the number of schools similar to yours that is shown in Figure 3.3 could be low.

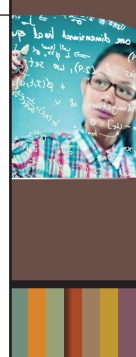
Box 3.2 **Making the most of top teachers**

In many education systems in Europe and Asia, certain teachers – known as homeroom or classroom teachers – follow students through a number of grades. They assume a holistic responsibility for the students in their class and form a close relationship not only with the students but also with the students' parents. In both Asia and Europe, it is typical in such cases that a notebook is passed back and forth between the teacher and the parents, in which each party shares information about the student. These relationships lead to a kind of parental involvement in the education of their children that is rare in the United States, as well as to a spirit of collaboration between teacher and parents that is also unusual (OECD, 2011c). In some countries, such as in Japan, homeroom teachers even provide academic and career advice to students in upper secondary school.

Effective teachers are recognized and asked to actively support fellow teachers. Those who demonstrate the very best practices in Canada, Finland and some East Asian countries are relieved, full-time or part-time, of their regular classroom duties in order to mentor new teachers and provide demonstrations to teachers in their own and other schools.

Top teachers as resources in Shanghai-China

Shanghai provides just such an example of an education system that recognizes and mobilizes its highest-performing teachers. Teachers are classified into four grades that indicate their professional status. Promotion from one grade to the next often requires the capacity to give demonstration lessons, contribute to the induction of new teachers, publish in journals or magazines about education or teaching and other elements. The provincial office often identifies the best teachers emerging from evaluation processes and relieves them of some or all of their teaching duties so that they may give lectures to their peers, provide demonstrations and coach other teachers on a district, provincial and even national level. Carefully chosen schools are often asked to pilot new programs or policies, and the best teachers in those schools are enlisted as co-researchers to evaluate the effectiveness of the new practices (OECD, 2012f).



This picture of teaching in Shanghai-China would not be complete without pointing out that almost all of the officers in the government education authorities, at both municipal and district levels, started as schoolteachers. Most of them distinguished themselves as teachers or school principals with strong track records. This may explain their strong commitment to teaching and learning amidst all of the administrative duties and political issues that they normally have to contend with.

To find out more about highest-performing teachers and their practices, go to:

- [*Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World*](#)
- [*Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*](#)
- [*Evaluating and Rewarding the Quality of Teachers: International Practices*](#)

Sources: OECD (2009b), [*Evaluating and Rewarding the Quality of Teachers: International Practices*](#), OECD Publishing, Paris.
 OECD (2011c), [*Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*](#), OECD Publishing, Paris.
 OECD (2012f), [*Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World*](#), OECD Publishing, Paris.

Teacher-student relations

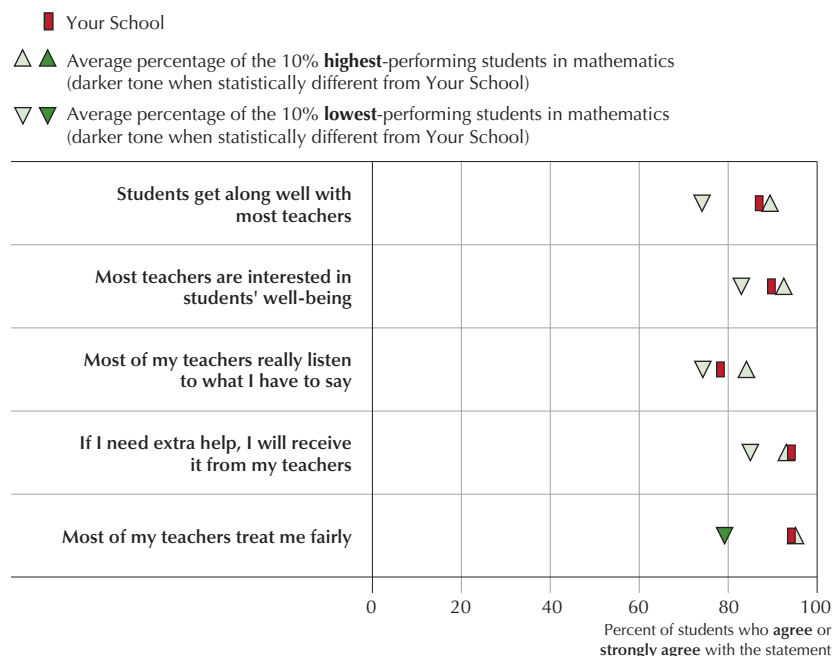
Along with the disciplinary climate, teacher-student relations at the school are a key element of the learning environment that is positively associated with student performance.

Figure 3.4 shows to what extent students at your school agree with several statements regarding the relationship with teachers. These statements reflect whether they get along well with most of their teachers, whether they feel that their teachers are interested in their well-being, whether the teachers listen to what the students have to say, whether the teachers provide extra help when needed and whether the students feel that teachers treat them fairly.

To place your school's results in context, the figure also shows how the highest- and lowest-performing students in the United States responded to the same questions in PISA 2012. As with similar figures, when comparing the teacher-student relations at your school to those of students in other schools, the darkness of the triangular markers indicates whether the responses for students at your school are statistically different from the highest- or lowest-performing students in the United States who participated in PISA.

In PISA 2012 students from 65 countries and economies were asked the same questions on their teacher-student relations. The results from OECD countries suggest that students are generally satisfied with their relations with teachers. On average across OECD countries, 82% of students reported that they agree or strongly agree that they get along well with most of their teachers. In the United States the figures are comparable, with 83% of students agreeing that they get along well with most of their teachers. In the United Kingdom and Canada, students report similarly positive teacher-student relations, with 85% and 86% of students, respectively, agreeing with the statement. The overall teacher-student relations in the United States, the United Kingdom and Canada is similar to the OECD average.

Figure 3.4 ■ **Teacher-student relations at your school and among the highest- and lowest-performing students in the United States in PISA 2012**



Source: OECD.

Teacher-student relations and mathematics performance

Student responses on the five questions covering teacher-student relations can be converted into a single index score that indicates the overall teacher-student relations at your school and at others. Figure 3.5 shows the teacher-student relations at your school in comparison with those of schools in the United States with similar socioeconomic backgrounds of students among the schools that participated in PISA mathematics.

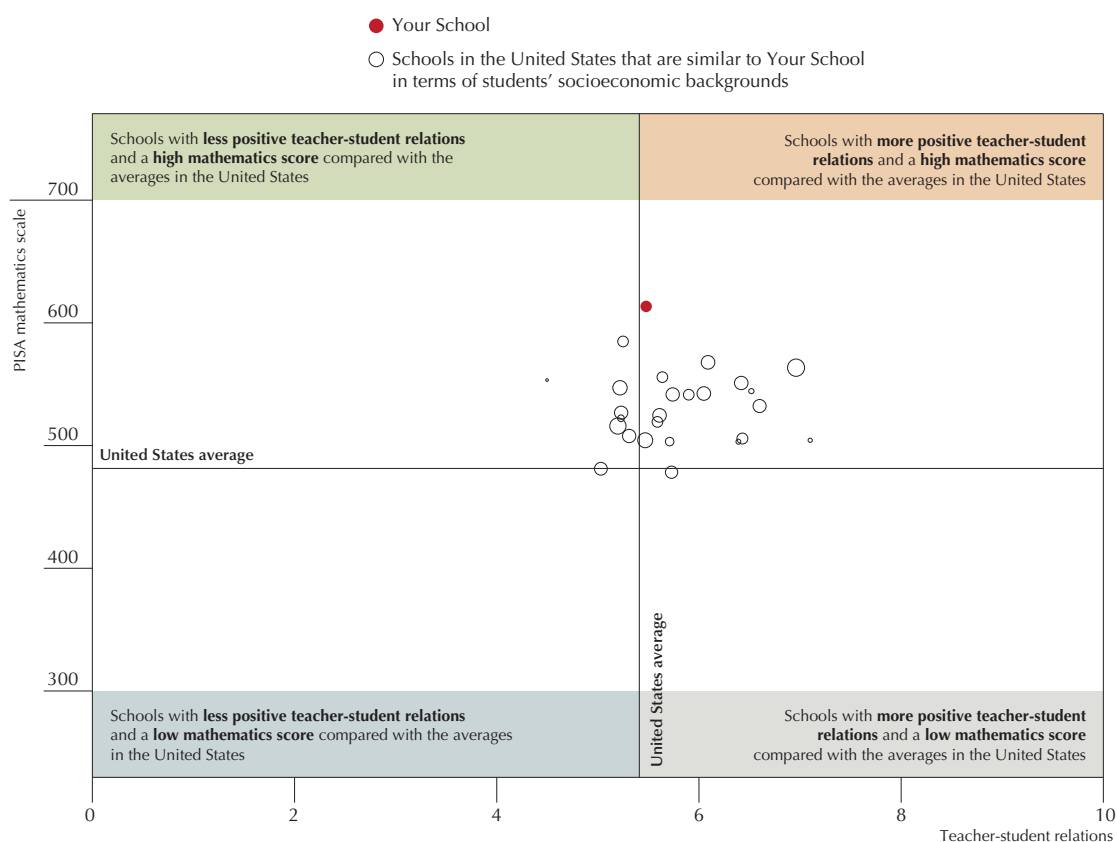
On this figure the students' responses to the five questions shown in Figure 3.4 have been used to create an index score on a scale from 0 to 10. The higher the score on this scale, the more positive the teacher-student relations at the school. This is represented by the *horizontal axis*. Thus the further to the right in the figure, the more positive the teacher-student relations are at the school.

The average teacher-student relations in the United States, indicated by the vertical line, is 5.4 points on the index.

Your school is represented by a red bubble in the figure, and schools in the United States with a socioeconomic background similar to that of your school are represented by hollow bubbles. The number of similar schools depends on the number that participated in PISA 2012 that share the same socioeconomic characteristics as your school. If the average socioeconomic background of students at your school is very low or very high compared with that of other schools in the United States, then the number of schools shown in Figure 3.5 that is similar to your school may be limited.

The results in Figure 3.5 are presented across four quadrants showing the teacher-student relations and the mathematics performance for each school. The top-right quadrant shows schools in which both teacher-student relations and mathematics performance are *above* the United States average. The bottom-left quadrant, on the other hand, shows schools that are *below* the United States average in mathematics performance and teacher-student relations. In the top-left and the bottom-right quadrants, either teacher-student relations or mathematics performance is above average, while the other is below the average of the United States.

Figure 3.5 ■ **Teacher-student relations and mathematics performance at your school compared with that of similar schools in the United States in PISA 2012**



Source: OECD.



STUDENTS' READING HABITS AND THE RELATIONSHIP WITH PERFORMANCE

The rest of this section will take a closer look at the association between student-related factors and the performance in each of the three subjects covered by the assessment: reading, mathematics and science. The first part of the section will focus on reading.

PISA results have shown that two factors are closely associated with students' high performance in reading:

- Students who read a wide variety of materials for enjoyment are the most proficient readers. Although students who regularly read fiction tend to be the highest-performing, those who read a wider variety of materials for enjoyment achieve the highest scores in PISA.

Students were asked to indicate how often they read magazines, comic books, fiction (novels, narratives and stories), non-fiction and newspapers because they want to. They could indicate that they read each type of material "never or almost never," "a few times a year," "about once a month," "several times a month" and "several times a week."

- Students who are highly aware of the most effective learning strategies to understand, remember and summarize information are more proficient readers than those students with low levels of effective learning strategies.

Students were asked to specify to what extent they believe that 11 reading strategies are effective, including strategies such as “I quickly read through the text twice,” “After reading the text, I discuss it with other people” and “I underline important parts of the text.” Student awareness of what strategies are the most effective was established by comparing the rating of students with those of international reading experts.

In Figure 3.6, students at your school are grouped into six reader profiles that take into account both their reading habits and their understanding of effective learning strategies, building on the evidence of the strong association between these two factors and students’ reading proficiency.

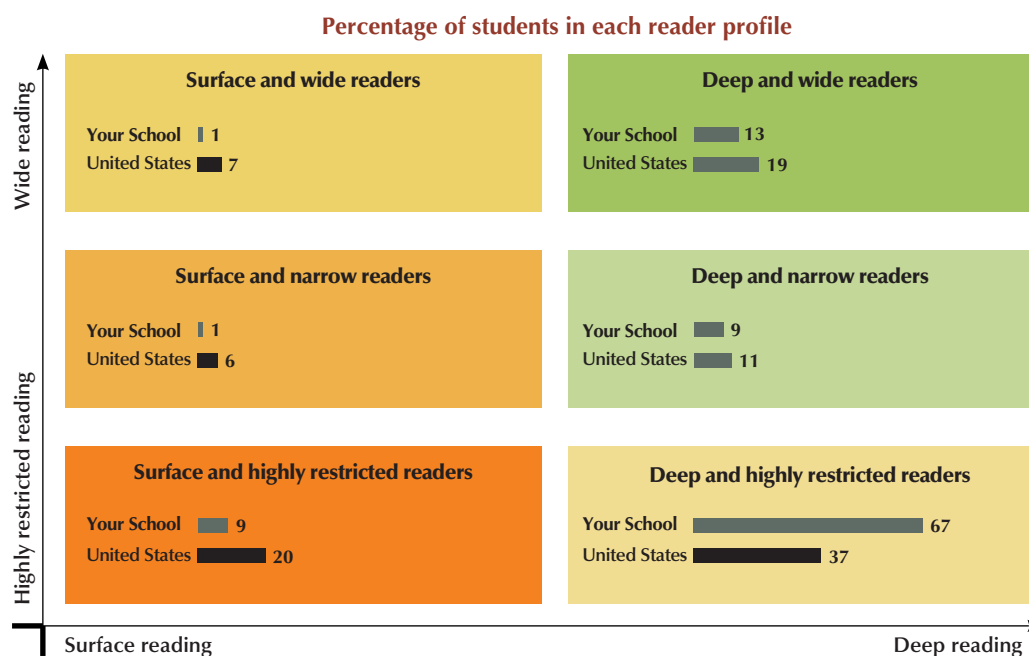
Students who are “deep and wide readers” (the top-right corner on the figure) have a deep understanding of the most effective learning strategies – as determined by reading experts – and they also read a wide variety of materials for enjoyment. In the opposite corner of the figure, students who are “surface and highly restricted readers” have a poor understanding of the most effective learning strategies and they only spend little time reading any type of printed material for enjoyment.

For each category of reader profiles the figure presents the percentage of students at your school in the category and the percentage of students across the United States as measured by PISA 2009. A percentage of students of a particular reader profile at your school that is statistically different from the percentage in your country is marked by a darker bar.

A description of the six reader profiles shown in Figure 3.6:

	Surface	Deep
Wide	Surface and wide readers These students have low levels of awareness about effective strategies to understand, summarize and remember information, but they read a wide variety of materials regularly, including fiction and non-fiction books. In the United States, 7% of 15-year-old students are surface and wide readers.	Deep and wide readers These students are those who have high levels of awareness about effective learning strategies and who also read all sorts of materials, including fiction and non-fiction books for enjoyment. In the United States, 19% of students are deep and wide readers.
Narrow	Surface and narrow readers Students with this reader profile have low levels of awareness about effective learning strategies and their reading habits are narrow in the sense that they do not read a wide variety of materials, but they do read some materials regularly for enjoyment. This profile accounts for 6% of students in the United States.	Deep and narrow readers Students in this group also have high levels of awareness about effective learning strategies, but their reading habits are more <i>narrow</i> than those of <i>deep and wide readers</i> . This reader profile accounts for 11% of students.
Highly restricted	Surface and highly restricted readers Students in this group have low levels of awareness about effective learning strategies and they spend little time reading any type of printed material for enjoyment. In the United States, 20% of students are surface and highly restricted readers.	Deep and highly restricted readers These students are aware of effective learning strategies, but they do not regularly read any printed material for enjoyment. With 37% of students being deep and highly restricted readers, this profile accounts for the largest number of students in the United States.

Figure 3.6 ■ Reader profiles at your school and in the United States in PISA 2009



Note: Values that are statistically significantly different from your school are marked in a darker tone.
Source: OECD.

How well different types of students read

To better understand how well different types of students read at your school, Figure 3.7 shows the mean reading performance for students in each reader profile at your school, in the United States and in four other countries that participated in PISA 2009. The comparison countries include the two other countries that have schools participating in the *OECD Test for Schools* pilot and two of the highest-performing countries, Finland and Korea.

The first chart in Figure 3.7 shows the mean reading performance for students in your school, grouped in the six reader profiles shown in Figure 3.6.

Across all five comparison countries, students in the group of “deep and wide readers” show higher reading performance than those in the other reader profiles. These students have high levels of awareness about effective learning strategies and read varied types of materials regularly, including fiction and non-fiction books. In contrast, students who are grouped in one of the three profiles of “surface” readers in the figures have less awareness of effective learning strategies, which is reflected in their lower reading performance on average.

In the United States, students in the group of “deep and wide readers” have an average reading performance of 539 points, compared with those in the group of “surface and narrow readers” with an average performance of 454. This difference in reading proficiency is equivalent to approximately two years of schooling. The gap is even wider among students in the United Kingdom, with a difference of 104 score points on average between students who are “deep and wide readers” compared with those who are “surface and narrow readers.” In Canada, students in the group of “deep and wide readers” perform 93 points higher on average than “surface and highly restricted readers.”

On the right-hand side of the figures, you’ll find the corresponding proficiency levels at which the students are reading.



Box 3.3 **How schools in Korea use ICT to make a successful education system even better**


In the last 50 years, South Korea has transformed itself from a developing nation into a leading industrial economy, thanks mostly to its efforts in raising educational standards. PISA shows that in South Korea's highly competitive society, families place a high value on education, students show strong commitment to learning and government policies support education with above-average spending (OECD, 2011b).

A major objective of successive government administrations in South Korea has been to reduce inequalities in access to education, and ICT (information and communication technologies) are seen as critical to achieving that goal. In 2005, the government launched a Cyber Home Learning System that gives students home access to digital tutoring. In 2011, building upon pilot projects launched in 2007, the Korean government announced a USD 2.4 billion strategy to digitize the nation's entire school curriculum by 2015.

At the core of this ambitious project, dubbed "Smart Education," is the implementation of "digital textbooks," interactive versions of traditional textbooks that can be continuously updated in real time. Digital books contain a combination of textbooks, reference books, workbooks, dictionaries and multimedia content such as video clips, animations and virtual-reality programs that can be tailored to students' abilities and interests. Students can underline sections, take notes, reorganize pages and create hyperlinks to online material. By making access to new learning modes available to all, Smart Education will help to bridge the education divide between families who can afford to pay for private tutoring and those who cannot.

Policy makers say that this project is designed to respond to 21st-century education challenges by moving from uniform and standardized education to diversified, creativity-based learning. The project has shown positive results, as the groups using digital textbooks demonstrate better skills in problem solving and in self-directed studying, the performance of economically disadvantaged groups has improved more than that of other groups and students using digital textbooks concentrate better on the content than those using normal paper textbooks. In addition, students' use of ICT devices for social and recreational purposes helps them to develop reactivity and response capabilities that are useful in academic contexts as well (OECD, 2011d). Although it is clear that the success of schools cannot be based solely on ICT, successful schools around the world show that ICT can be harnessed as a powerful tool for student learning.

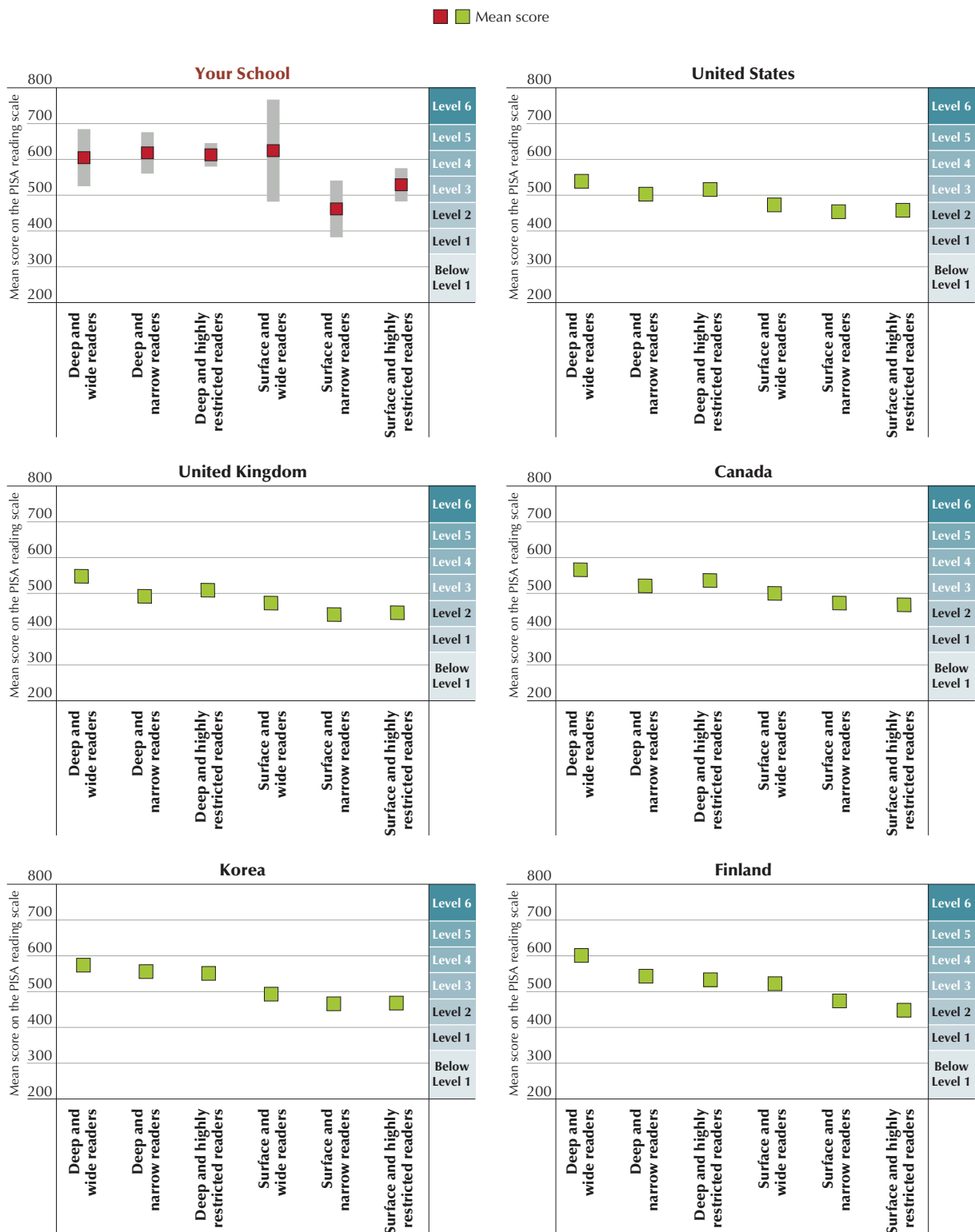
To find out more about learning in the digital age, go to:

-  [*Strong Performers and Successful Reformers in Education: Using ICT to make a successful education system even better*](#)
- [*PISA in Focus 12: Are boys and girls ready for the digital age?*](#)

Sources: OECD (2011b), [*Education at a Glance 2011: OECD Indicators*](#), OECD Publishing, Paris.

OECD (2011d), [*PISA 2009 Results: Students On Line: Digital Technologies and Performance \(Volume VI\)*](#), OECD Publishing, Paris.

Figure 3.7 ■ How well different types of readers read at your school, in your country and internationally in PISA 2009



Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance scores would fall within this confidence interval. Source: OECD.

STUDENTS' ATTITUDES TOWARD MATHEMATICS AND THE RELATIONSHIP WITH PERFORMANCE

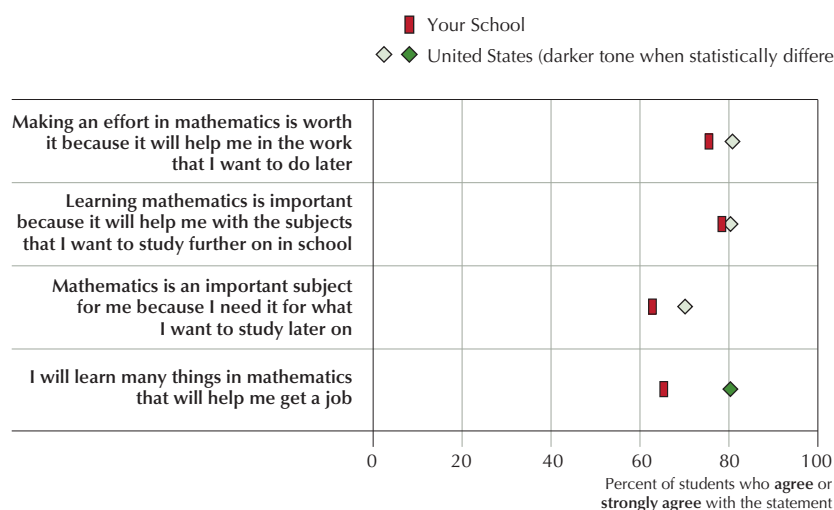
The focus of the next set of figures shifts from reading to mathematics. The figures seek to answer such questions as: How motivated are students at your school to learn mathematics? How confident are they in their abilities to solve difficult mathematics tasks? How are students' motivation and self-belief related to learning outcomes in mathematics?

Instrumental motivation in mathematics

Figure 3.8 shows how students at your school responded to four questions regarding their motivation to learn mathematics. The questions focus on the students' *instrumental motivation* in the sense of how important they see mathematics in their own lives as they move on to further studies and the labor market. Instrumental motivation has been found to be an important predictor for course selection, career choice and job performance (Eccles, 1994).

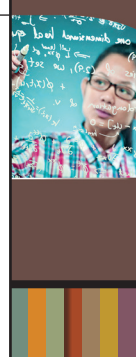
Student responses for your school are compared to responses from a representative sample of United States students who participated in PISA 2012, when mathematics was the main focus. Across the United States, 81% of students agree or strongly agree that "making an effort in mathematics is worth it because it will help me in the work that I want to do later"; 80% agree or strongly agree that "learning mathematics is important because it will help me with the subjects that I want to study further on in school"; 70% agree or strongly agree that "mathematics is an important subject for me because I need it for what I want to study later on"; and 80% agree or strongly agree that "I will learn many things in mathematics that will help me get a job."

Figure 3.8 ■ **Students' instrumental motivation in mathematics at your school and in the United States in PISA 2012**



Source: OECD.






Box 3.4 **The importance of student engagement in Japan**

Many people outside Japan imagine Japanese schools as quiet, intense places where students quietly and diligently write down everything the teacher says. But that is far from what actually occurs. In fact, visitors to Japanese schools often report that the level of noise is often well above that found in Western classrooms (OECD, 2011c). Students can often be heard excitedly talking with one another as they tackle problems together. PISA results show that this approach to education is far from ineffective, as the performance of Japan's students in reading, and most notably in mathematics and science, is quite impressive compared with those in other OECD countries (OECD, 2013b).

Maximizing student engagement is a major key to the success of Japanese schools. Japanese teachers spend little time on drilling or lecturing. Teachers in a mathematics class, for example, will spend an entire lesson focusing on one practical problem, not in order to get hold of the right answer from the students but to make them think of all possible solutions. Contrary to Western countries, where mistakes and wrong answers are something to be avoided, Japanese teachers will ask all their students to work together in groups on a problem in order to come up with plausible solutions (OECD, 2011c). Students will be asked to explain their approaches, and other students will evaluate them. If students disagree with an approach, they must back up their reasoning with concrete evidence. Using this approach, students examine all sides of the mathematical problem while learning that some answers are wrong for interesting reasons and discovering other approaches that they didn't know were possible. As a result, students have a deeper grasp of the mathematics that underline the solution to the problem.

Principal Yasuo Komatsu of Karakuwa Junior High School recently explained the approach of teaching and learning in Japan when describing the skills that are critical to students facing a rapidly changing society: "Students need to determine what the problem is and analyze the information. And based on that, they need to make their assessments, think independently and express what they think. These skills are required for them to live in this society."

To find out more about the approaches to teaching and learning in Japan's schools, go to:

-  [Strong Performers and Successful Reformers in Education: Educating students to think independently in confronting the challenges of modern society](#)
- [Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education](#)

Sources: OECD (2013b), [PISA 2012 Results: What Students Know and Can Do: Student Performance in Mathematics, Reading and Science \(Volume I\)](#), OECD Publishing, Paris.

OECD (2011c), [Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education](#), OECD Publishing, Paris.

Students' self-efficacy in mathematics

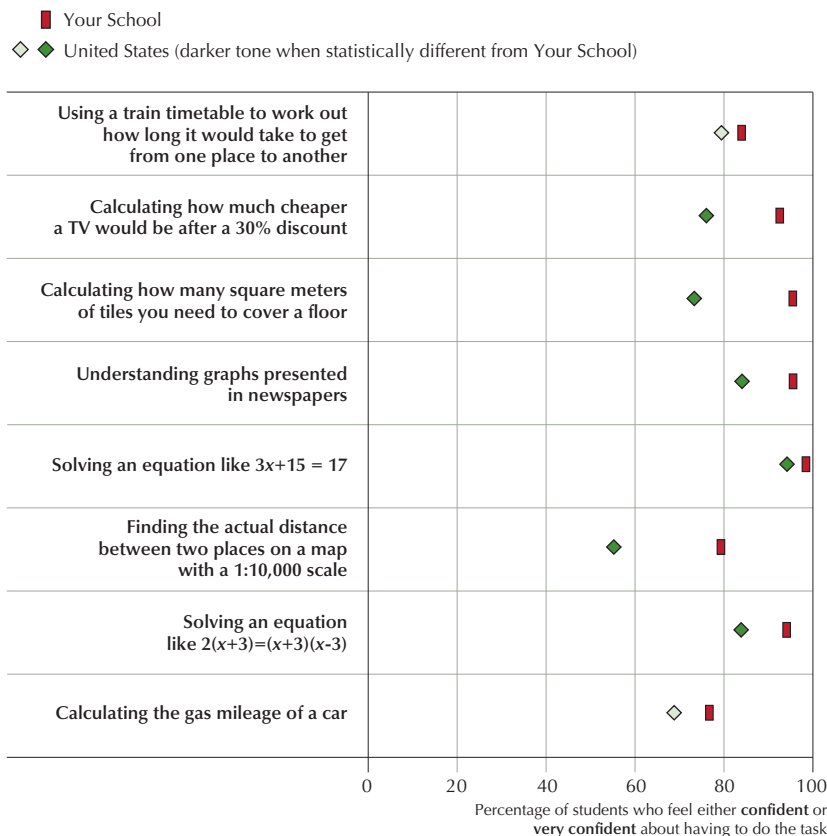
Successful learners often believe in their own *self-efficacy*: they are confident in their ability to solve tasks related to mathematics. In fact, students' self-efficacy is one of the strongest predictors of their performance, explaining on average 23% of the variance in mathematics performance across OECD countries.

One might ask if students' beliefs about their abilities simply mirror their performance. Research has given strong evidence, however, for assuming that confidence helps to drive learning success, rather than simply reflecting it. Students need to believe in their own capacities before making necessary investments in learning strategies that will help them achieve higher performance (Zimmerman, 1999).

Figure 3.9 shows how students at your school responded to eight questions regarding their *self-efficacy in mathematics*. They were asked how confident they feel about having to do each of the mathematics tasks mentioned in the figure. The values in the figure represent the percentage of students who responded they are “confident” or “very confident” about having to do the task.

The figure also shows how confident students in the United States on average feel about having to do the tasks, as measured by PISA 2012. The task that most students feel confident about is “Solving an equation like $3x + 15 = 17$.” Nine out of ten students in the United States are confident or very confident that they can solve that task. At the other end, the task that students feel less confident about is “Finding the actual distance between two places on a map with a 1:10,000 scale.” Six out of ten students in the United States feel that they can solve that task.

Figure 3.9 ■ **Students’ self-efficacy in mathematics at your school and in the United States in PISA 2012**



Source: OECD.

These responses make students in the United States some of the most confident students internationally. The high level of confidence reported by students in PISA 2012, however, is not reflected by the average performance of students in mathematics in the United States in PISA 2012, when the United States performed *below* the OECD average. Yet when looking at the relationship within the United States, confidence is highly correlated with student performance. While the quarter of students with the *lowest* levels of self-efficacy in mathematics

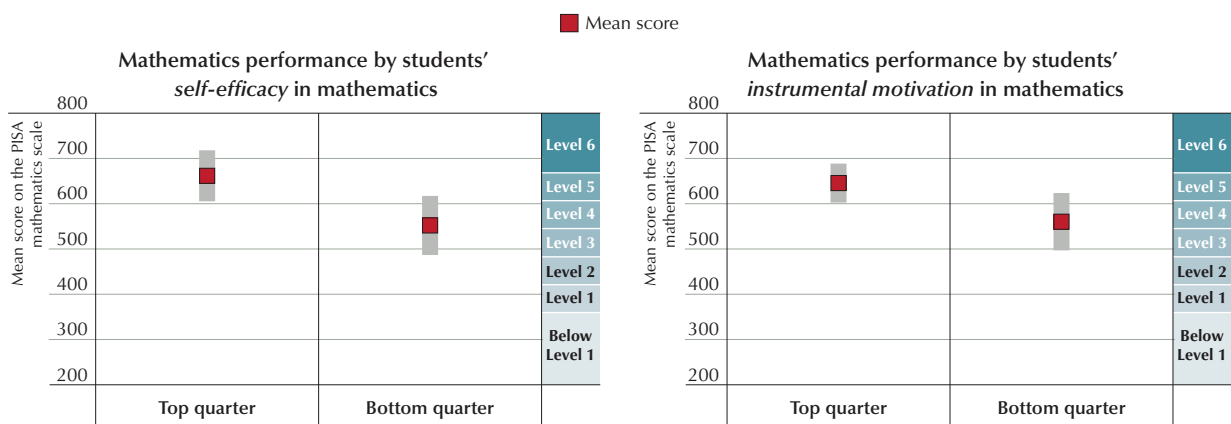
showed a mean performance of 424 points in PISA 2012 (less than the average student in Turkey), the quarter of students with the *highest* levels of self-efficacy in the United States showed a mean performance of 553 points, a performance level similar to that of an average student in a highest-performing country such as Korea.

How students' motivation and self-efficacy relate to their mathematics performance

While the two previous figures show how motivated and confident students at your school are when learning mathematics, the next figure shows how these factors relate to performance in mathematics.

Figure 3.10 shows how the *self-efficacy* and *instrumental motivation* of students at your school relate to mathematics performance. The first chart shows how students at your school with the *highest* level of self-efficacy in mathematics (the top quarter) perform in mathematics compared with students with the lowest levels of self-efficacy reported at your school (the bottom quarter). The top and bottom quarters of students have been identified by grouping each student's responses on the eight questions shown in Figure 3.9. The 25% of students at your school who show the *highest* level of confidence across the eight questions constitute the top quarter, while the 25% of students at your school who show the lowest levels of confidence across the eight questions constitute the bottom quarter.

Figure 3.10 ■ **How instrumental motivation and self-efficacy in mathematics relate to performance at your school**



Note: Shaded bars above and below the mean scores represent the 95% confidence interval.
Source: OECD.

Similarly, the second chart in the figure shows mathematics performance for students by instrumental motivation. The top quarter of students in terms of instrumental motivation is the 25% of students at your school with the most positive responses to the four questions shown in Figure 3.8. Similarly, the bottom quarter of students is the 25% of students with the least positive responses to these four questions.

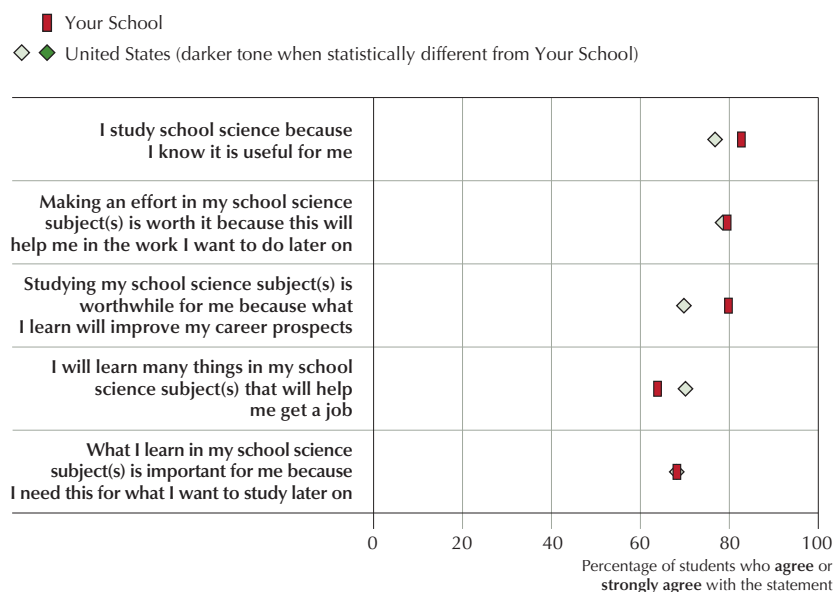
STUDENTS' SELF-BELIEF AND INTEREST IN SCIENCE AND THE RELATIONSHIP WITH PERFORMANCE

In the last set of figures, the focus shifts to students' motivation and self-efficacy in *science*. Although their engagement with science may be particularly relevant for schools with a specific focus on science and technology, the information in these figures may be helpful for other schools as well given the close association between motivation, self-efficacy and student performance in science.

Instrumental motivation in science

Figure 3.11 shows how students at your school responded to five questions regarding their motivation to learn science. The questions focus on students' instrumental motivation in the sense of how important they see science for their own lives as they move on to further studies and the labor market.

Figure 3.11 ■ Students' instrumental motivation in science at your school and in the United States in PISA 2006



Source: OECD.

The responses provided by students at your school are compared with responses from a representative sample of students in the United States who participated in PISA 2006 when science was the main focus of the assessment. Across the United States, 77% of students agree or strongly agree with the statement "I study school science because I know it is useful for me"; 78% agree or strongly agree that "making an effort in my school science subject(s) is worth it because this will help me in the work I want to do later on"; 70% agree or strongly agree that "studying my school science subject(s) is worthwhile for me because what I learn will improve my career prospects"; 70% agree or strongly agree with "I will learn many things in my school science subject(s) that will help me get a job"; and 68% agree or strongly agree with "What I learn in my school science subject(s) is important for me because I need this for what I want to study later on."



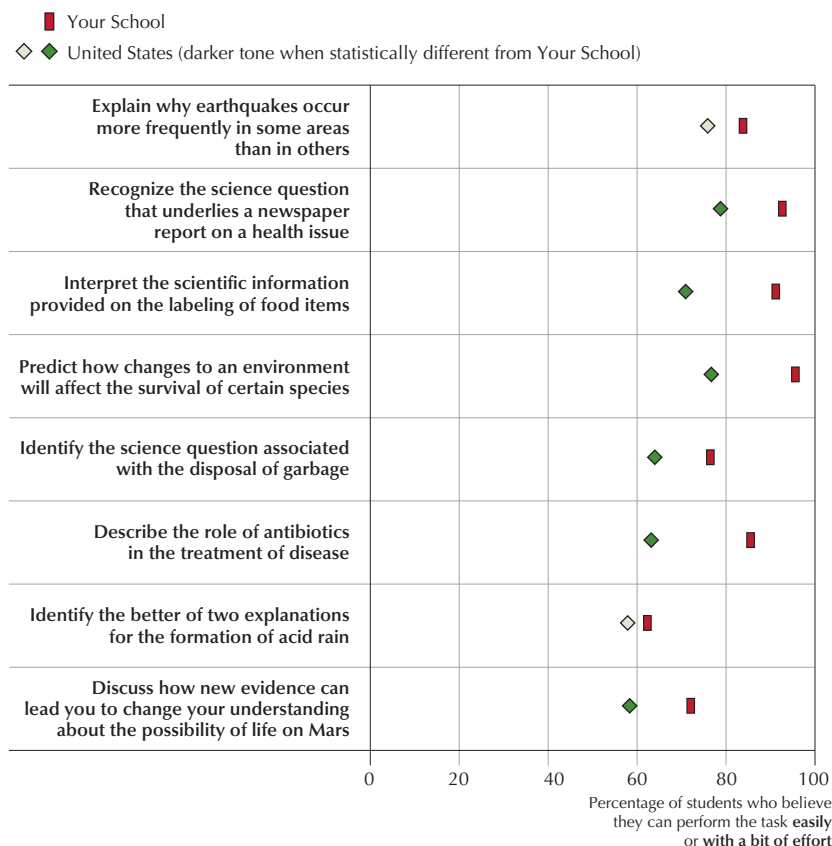
Students' self-efficacy in science

Students who lack confidence in their ability to solve science tasks often tend to show weaker performance results than those with a high level of self-efficacy. Although improvements in confidence to some extent seem to mirror the students' performance levels, improvements in performance and in self-confidence often need to go hand in hand: students with higher academic abilities are more confident, and in turn, students with higher confidence have the drive to make the efforts that improve their abilities.

Figure 3.12 shows how students at your school responded to eight questions regarding their self-efficacy in science. They were asked how confident they feel about having to do each of the science tasks mentioned in the figure. The values reported by the figure represent the percentage of students who responded they can perform the tasks "easily" or "with a bit of effort."

The figure also shows how confident students in the United States on average feel about having to do the tasks, as measured by PISA 2006. The task that most students in the United States feel that they can do "easily" or "with a bit of effort" is "Recognize the science question that underlies a newspaper report on a health issue." Eight out of ten students in the United States respond that they feel capable of the task. At the other end, the task that students feel less confident about is "Identify the better of two explanations for the formation of acid rain." Six out of ten students in the United States feel that they can solve that task "easily" or "with a bit of effort."

Figure 3.12 ■ **Students' self-efficacy in science at your school and in the United States in PISA 2006**



Source: OECD.

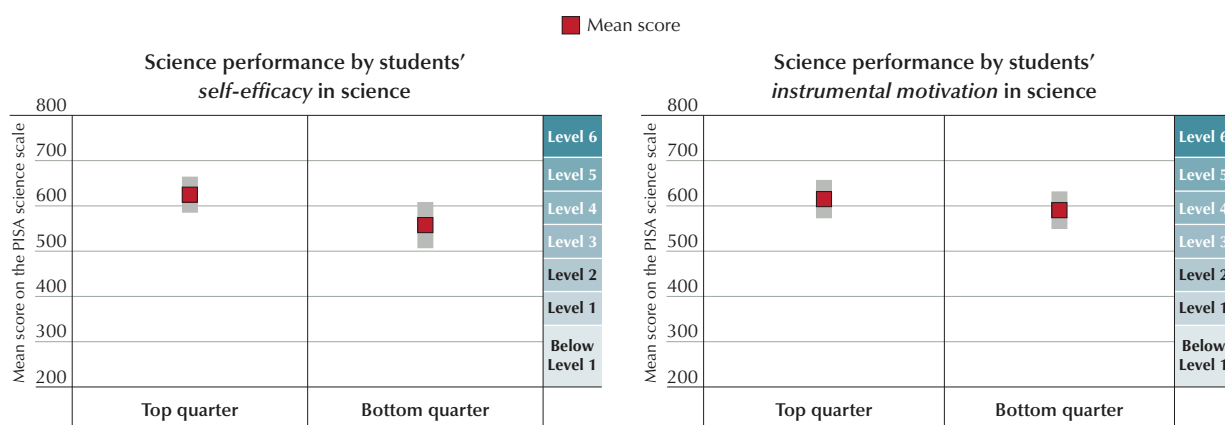
Similar to the case in mathematics, students in the United States are among the most confident internationally in solving science tasks. Of the 57 countries that participated in PISA 2006, only Poland showed higher levels of self-confidence in solving science tasks among its 15-year-old students.

How students' motivation and self-efficacy relate to their science performance

While the two previous figures show how motivated and confident students at your school are to learning science, the next figure shows how these factors relate to their performance in science.

Figure 3.13 includes two charts, both of which show results for your school. The first chart shows how students at your school with the *highest* levels of *self-efficacy* in science (the top quarter) perform in science compared with the students with the lowest levels of self-efficacy at your school (the bottom quarter). The top and bottom quarters of students have been identified by grouping each student's responses on the eight questions shown in Figure 3.12. The 25% of students at your school who show the *highest* levels of confidence across the eight questions constitute the top quarter, while the 25% of students who show the lowest levels of confidence across the eight questions constitute the bottom quarter.

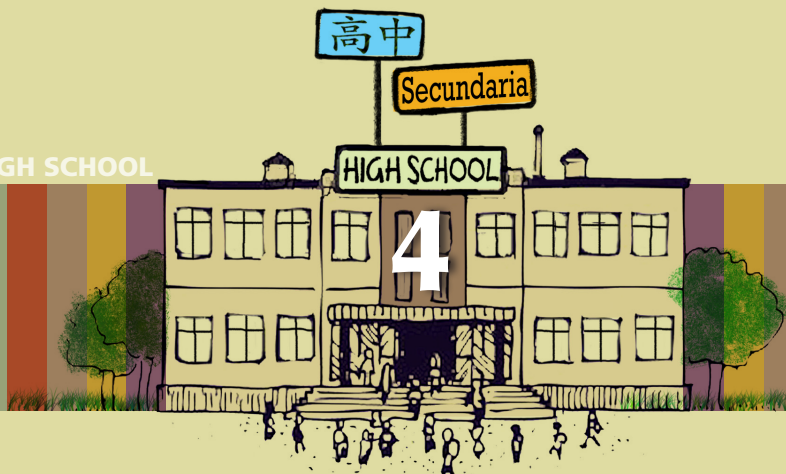
Figure 3.13 ■ **How instrumental motivation and self-efficacy in science relate to performance at your school**



Note: Shaded bars above and below the mean scores represent the 95% confidence interval.
Source: OECD.

Similarly, the second chart shows the science performance for students by *instrumental motivation*. The top quarter of students in terms of instrumental motivation is the 25% of students at your school with the most positive responses to the five questions shown in Figure 3.11. The bottom quarter of students is the 25% of students with the least positive responses to these four questions.





Your School Compared with Similar Schools in Your Country

Is your school performing in line with what would reasonably be expected given the relative socioeconomic advantage or disadvantage of students? Many schools in your country and in other education systems are successful in providing their students with the knowledge and skills that will enable them to compete with peers from the best education systems worldwide, but some are even able to do so with students from largely disadvantaged backgrounds. This section focuses on the relationship between the socioeconomic status of students and their performance relative to students and schools in your country, based on PISA 2012 results. It also presents the performance of your school in the context of public and private schools in your country and shows how performance can be considered in view of the average socioeconomic status of students.



HOW YOUR SCHOOL COMPARES WITH SIMILAR SCHOOLS IN THE UNITED STATES

Student learning outcomes do not occur in isolation to other factors. To better understand your school's performance results, therefore, it is important to consider these in light of students' socioeconomic backgrounds. It is well established that home background often influences educational success. In most countries, including the United States, large variations in performance can be found among schools due to the socioeconomic and cultural characteristics of the students and communities that they serve. It is therefore useful to compare your school's results with those of other schools across the country whose intake of students is similar to that of your school.

Figures 4.1, 4.2 and 4.3 show your school's average performance results in reading, mathematics and science along with the results of other schools in the United States that participated in PISA 2012. In each figure, the red bubble (at the center of the bands) represents your school. The hollow bubbles represent schools that participated in PISA 2012. It is important to remember that students in the PISA 2012 schools are a representative sample of students in the United States.

The scale on the bottom (the x-axis) refers to the socioeconomic status of students as measured by the PISA **index of economic, social and cultural status (ESCS)**.¹ The scale shows average index values of **-3.0** to **+3.0** (although this could have been calibrated differently, from 0 to 5 or 10 for example). The scale is calibrated so that a value of 1 equals a difference of 1 standard deviation from the OECD average of 0.0. The important element to keep in mind when reviewing these figures is that as values increase (from left to right), the average socioeconomic status of students increases: they are more advantaged in terms of their socioeconomic backgrounds. Thus, schools that are plotted toward the lower end of the scale (-2.0 for example) will appear on the left side of the figure, and one may conclude that students on average in these schools come from disadvantaged backgrounds. Schools plotted with higher ESCS values such as +1.0 or higher (toward the right side of the x-axis) serve students primarily from advantaged backgrounds.

Schools with a **similar socioeconomic background** to yours are indicated by the vertical **blue** band. The schools that appear in this blue band are serving students from similar socioeconomic backgrounds. These schools have an index value on the index of economic, social and cultural status (ESCS) that is within the range of 0.25 of a standard deviation from your school's value. Schools in the blue band, therefore, serve students who are on average from similar socioeconomic backgrounds.

With this information in mind, it is now useful to see whether other schools that fall within the vertical blue band are performing *above* or *below* your school level. Schools within the band that are well above your school show a higher student performance with a student intake similar to that of your school. Similarly, the schools within the band that are well below your school show a lower student performance with a student intake similar to that of your school.

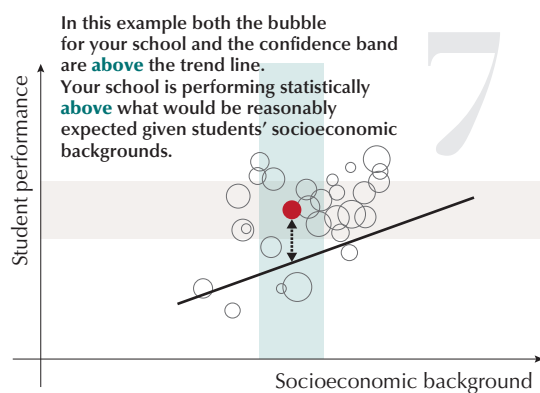
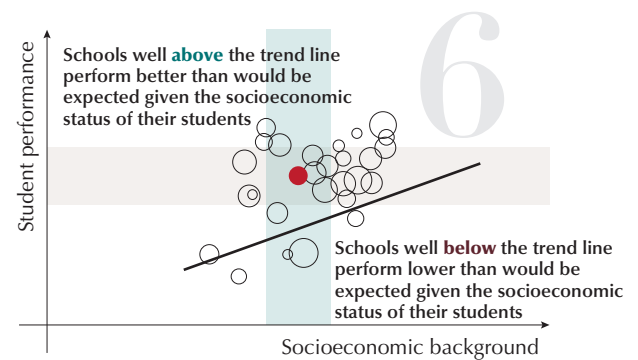
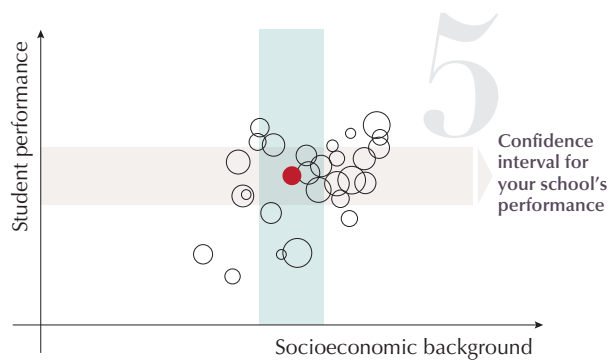
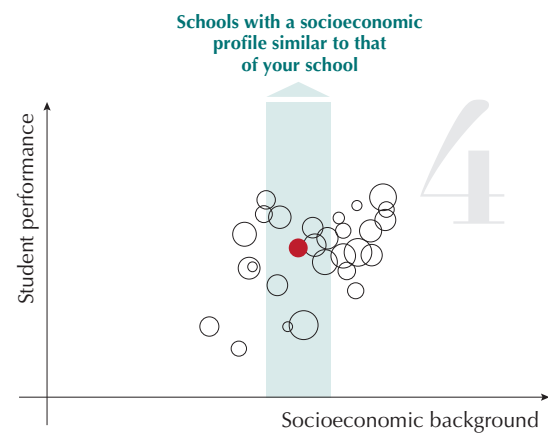
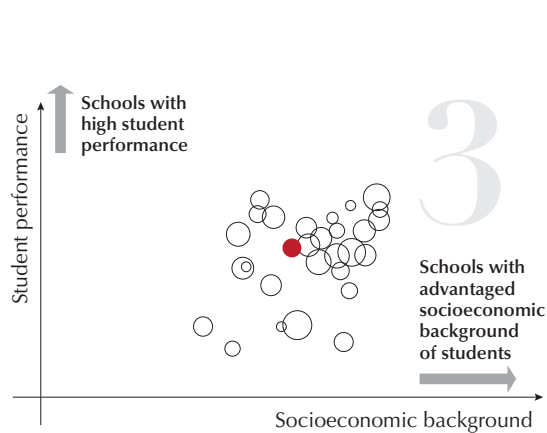
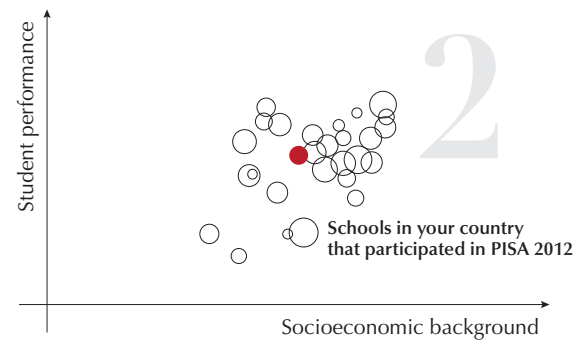
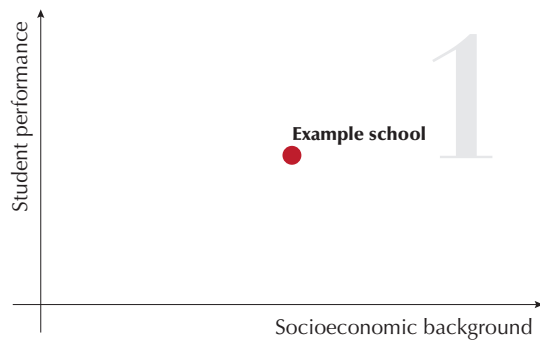
The diagonal line on the figures indicates the relationship (i.e., simple correlation) between socioeconomic background and performance among the schools that participated in PISA 2012 in the United States.² Schools well above the diagonal line perform better than what would reasonably be expected given the socioeconomic status of their students. Schools well below the line perform lower than what would reasonably be expected.

.....

1. The PISA index of economic, social and cultural status is based on information provided by students about their parents' education and occupations and their home possessions, such as a desk to use for studying and the number of books in the home. The index is standardized to have an average value of 0 and a standard deviation of 1 across all OECD countries. The United States has a value of 0.17, which is slightly higher than the OECD average.

2. The diagonal line is based on a linear regression of school mean estimates by average socioeconomic background of the students at the school level. Schools were weighted by the number of students enrolled.

HOW TO READ THE BUBBLE CHARTS

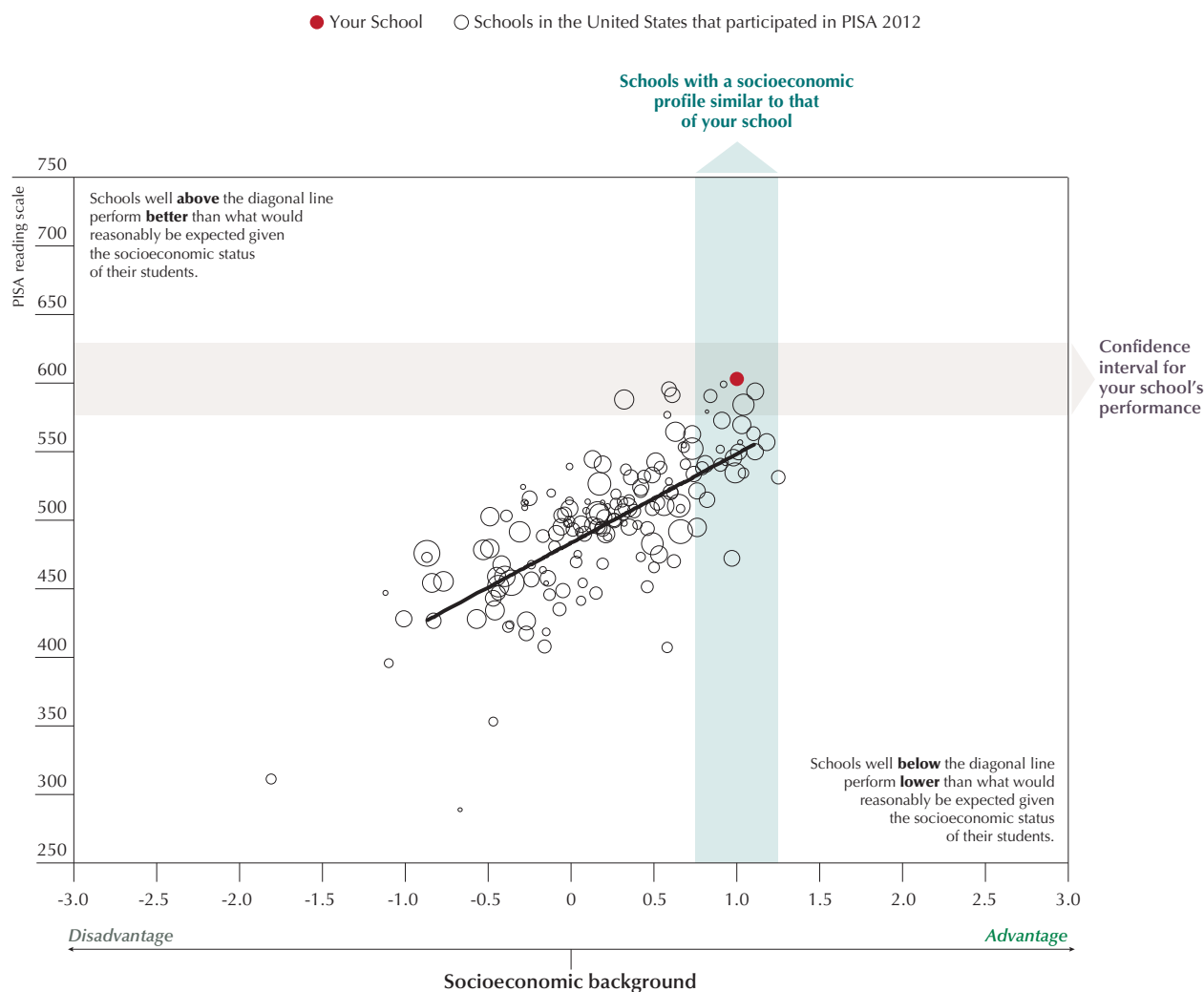


Example

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Whether your school is **well above** or **well below** the diagonal line can be used as an indication of how effective your school is compared with others across the country. If, for example, student performance is below average for the United States but the student intake at your school is relatively disadvantaged, your school could still show results that are better than expected given the backgrounds of the students enrolled. In that case, the red bubble representing your school will be well above the diagonal line. If, on the other hand, your school performs above average but most of your students come from mostly advantaged backgrounds, it is relevant to consider whether the relatively high performance for your school can be accounted for primarily by the students' socioeconomic backgrounds. If your school is well above the diagonal line, then its performance is higher than what would be expected on average among schools in the United States given similar students.

Figure 4.1 ■ How your school's results in reading compare with schools in the United States in PISA 2012

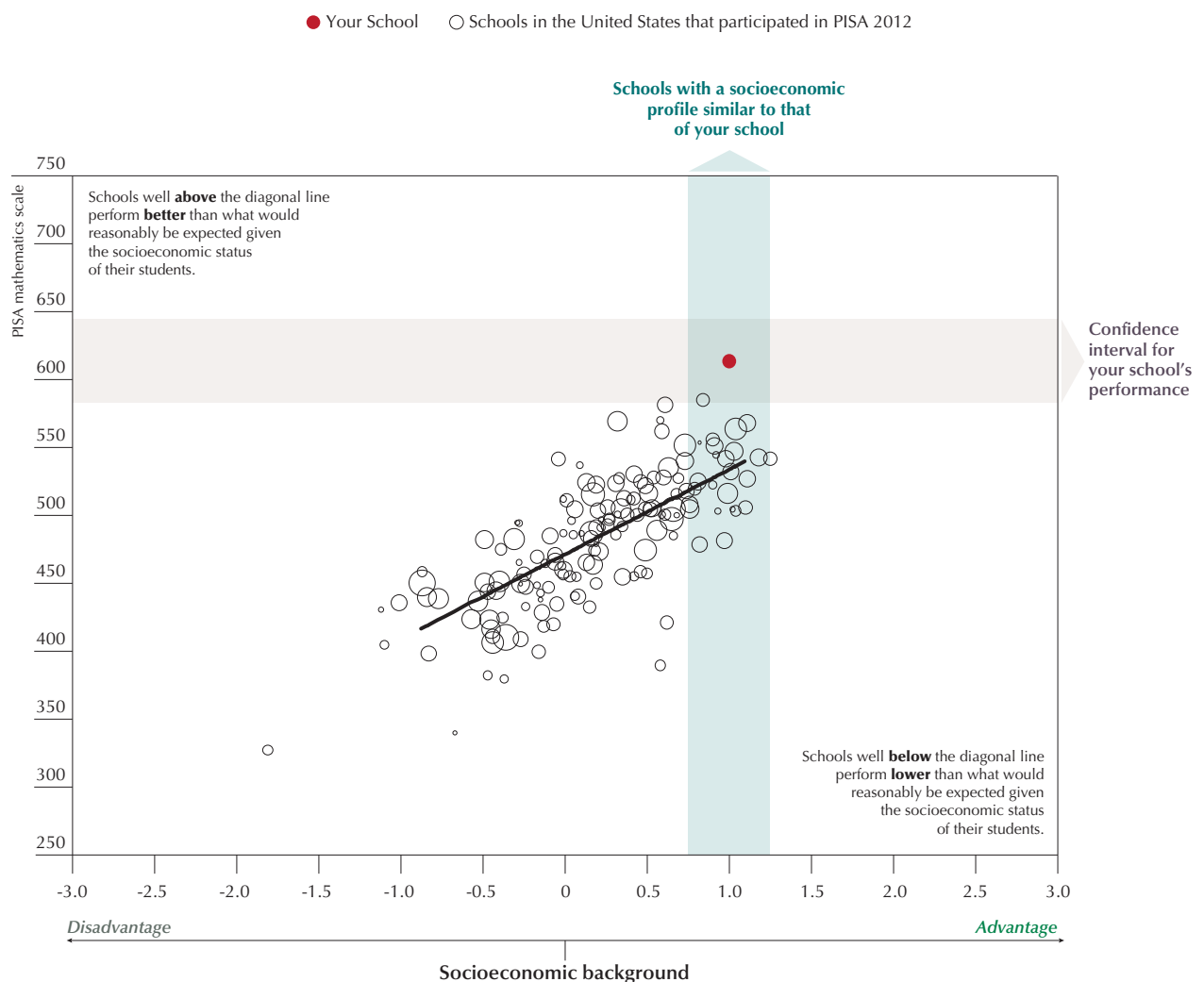


Note: Size of bubbles is proportional to the number of students enrolled at the school.
Source: OECD.

When comparing your school's performance to other schools, it is also important to take into account the statistical uncertainty associated with performance estimates. This uncertainty is represented by the **gray** horizontal band. You will notice that the red bubble that represents your school is located in the middle of this band. A simple way to identify whether your school's results can be considered as statistically below or above what would be expected given the students' socioeconomic backgrounds is to follow the following procedure:

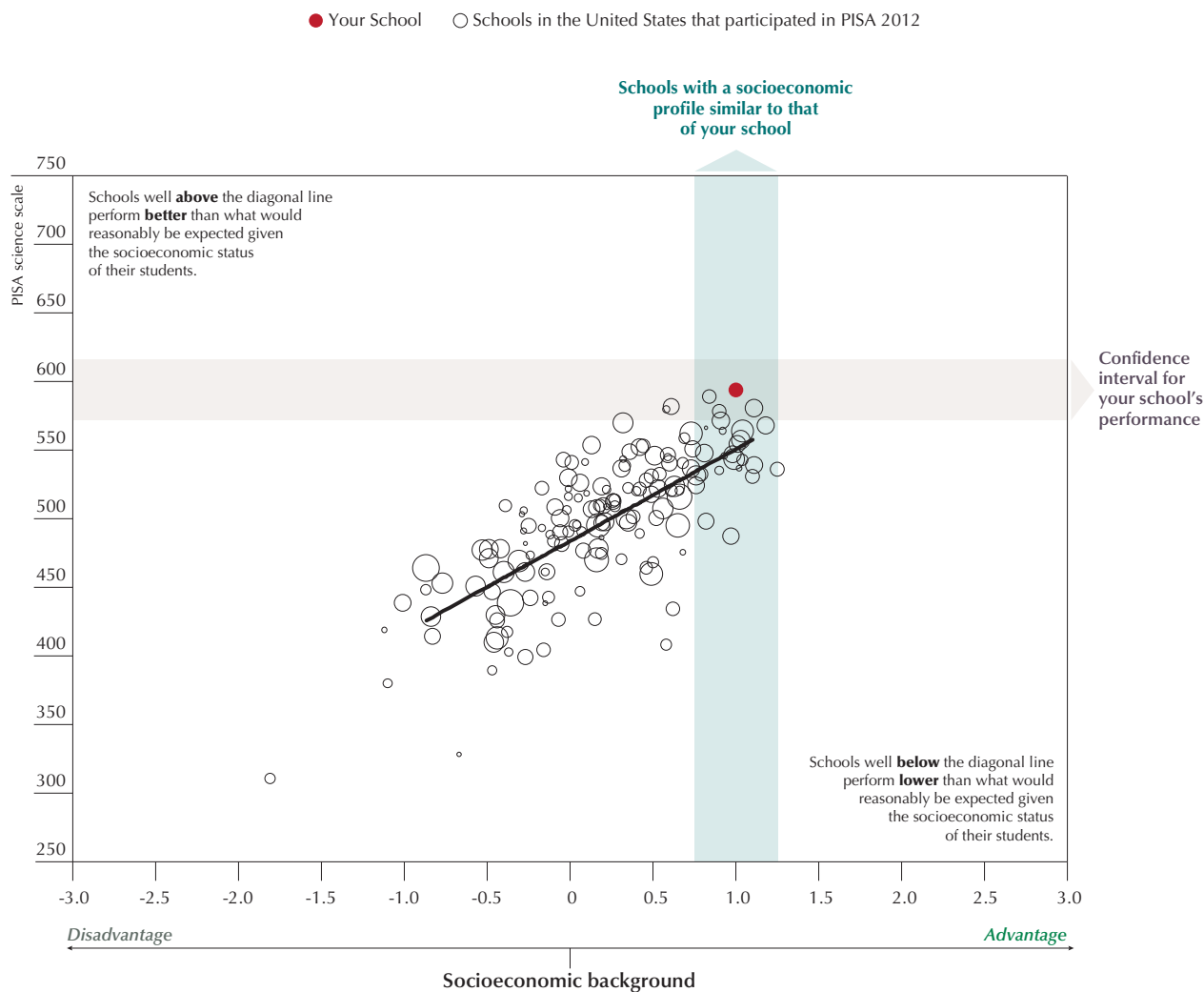
- *If your school is above the diagonal line:* Look at the gray band around your school's performance and find the lower border of the gray band, right beneath the red bubble that represents your school. If the lower border is above the diagonal line, then your school's performance is **significantly above** what would be expected.
- *If your school is below the diagonal line:* Look at the upper border of the gray band, right on top of the red bubble that represents your school. If the upper border is below the diagonal line, then your school's performance is **significantly below** what would be expected.

Figure 4.2 ■ **How your school's results in mathematics compare with schools in the United States in PISA 2012**



Note: Size of bubbles is proportional to the number of students enrolled at the school.
Source: OECD.

Figure 4.3 ■ How your school's results in science compare with schools in the United States in PISA 2012



Note: Size of bubbles is proportional to the number of students enrolled at the school.
Source: OECD.

The socioeconomic backgrounds of students in the United States

Students who did not surpass the most basic PISA performance level were not a random group. PISA 2012 results show that socioeconomic disadvantage has a strong impact on student performance in the United States: 15% of the variation in student performance in the United States is explained by students' socioeconomic background, similar to the OECD average. This contrasts with 10% or less in a number of OECD countries including Canada, Finland and Japan. In other words, in the United States, two students from different socioeconomic backgrounds vary much more in their learning outcomes than is normally the case in these other countries. Among OECD countries, the strongest impact of socioeconomic background on mathematics performance is found in Chile, France, Hungary and the Slovak Republic, where background explains more than 20% of the variation. It is important to note that these countries, including the United States, do not necessarily have a more disadvantaged socioeconomic student intake than other countries but that socioeconomic differences among students have a particularly strong impact on student learning outcomes.



Box 4.1 **The relationship between socioeconomic backgrounds and student performance in the United States**

PISA 2012 results show how four aspects of socioeconomic background relate to student performance in the United States:

- Across OECD countries, **community size** can have a strong impact on performance outcomes, contrary to the United States. PISA shows that students who attend schools located in cities with over 1 million inhabitants outperform those who attend smaller-town schools and rural schools even after taking into account students' socioeconomic background. Yet in the United States these differences are not significant *even before* adjusting for the socioeconomic background of students. Performance challenges for the United States therefore do not relate only to poor students in poor neighborhoods, but to many students in many neighborhoods.
- There is also the issue of **family structure**. While results from PISA show that single-parent families are more prevalent in the United States (20% of 15-year-olds in the United States come from a single-parent family compared with an average of 14% across OECD countries), results also show that these types of students face a much higher risk of low performance in the United States than across OECD countries.
- PISA 2012 results also illustrate the role that **immigrant students** play in performance compared with other OECD countries. Integrating students with an immigrant background is part of the socioeconomic challenge, and the performance levels of students who immigrated to the country in which they were assessed in PISA can only be somewhat attributed to the education system of their host country. Around 22% of 15-year-old students in the United States have an immigrant background as defined by being either first- or second-generation immigrants, and 34% of 15-year-old students are in schools that have more than a quarter of students with an immigrant background. These figures are surpassed only by Australia, Canada, Luxembourg, New Zealand and Switzerland (the OECD average is 15%).

Although it is tempting to attribute a performance lag to the challenges that immigrant inflows pose to the education system, the share of students with an immigrant background explains just 4% of the performance variation among countries. After the socioeconomic background of students is accounted for, immigrant students actually outperform non-immigrant students by 15 PISA score points, and this relative performance of immigrant students has improved over time.

- Another important fact is the **concentration of students in disadvantaged schools**. In the United States, *immigrant students attend schools with a more socioeconomically disadvantaged background*. These schools have a lower quality of educational resources, a less advantageous student/staff ratio and greater teacher shortages as reported by school principals. For example, in the United States, 40% of students in disadvantaged schools are immigrant students, whereas they account for 13% of the student population in advantaged schools. A similar pattern is observed among immigrant students who do not speak the language of assessment at home.

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To read more about these and other findings from PISA, go to:

- [PISA 2012 Results](#)
- [Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education](#)
- [Untapped Skills: Realising the Potential of Immigrant Students](#)

A reason for this disparity lies in the distribution of resources across students and schools. In higher-performing systems, principals in socioeconomically advantaged and disadvantaged schools reported similar levels of quality of physical infrastructure and schools' educational resources, both across OECD countries and across all countries and economies that participated in PISA 2012 (OECD 2013e). In the United States, the gap between the perceptions of principals in disadvantaged versus advantaged schools is large, with those from advantaged schools being far more positive. It is also important that, within school systems, much of the relationship between school resources and student performance is closely associated with schools' socioeconomic and demographic profiles. This suggests the need for more consideration on how to distribute resources for schools more equitably.



Your school's relative performance in comparison with similar schools

Student performance in reading, mathematics and science is usually closely correlated. Students who perform well in one subject often tend to perform well in other subjects as well. Some schools, however, have students who are challenged in one or more subjects or have specific talents. Some schools also have a high focus on some subjects, such as science, technology and mathematics, which might result in particularly strong learning outcomes in these subjects.

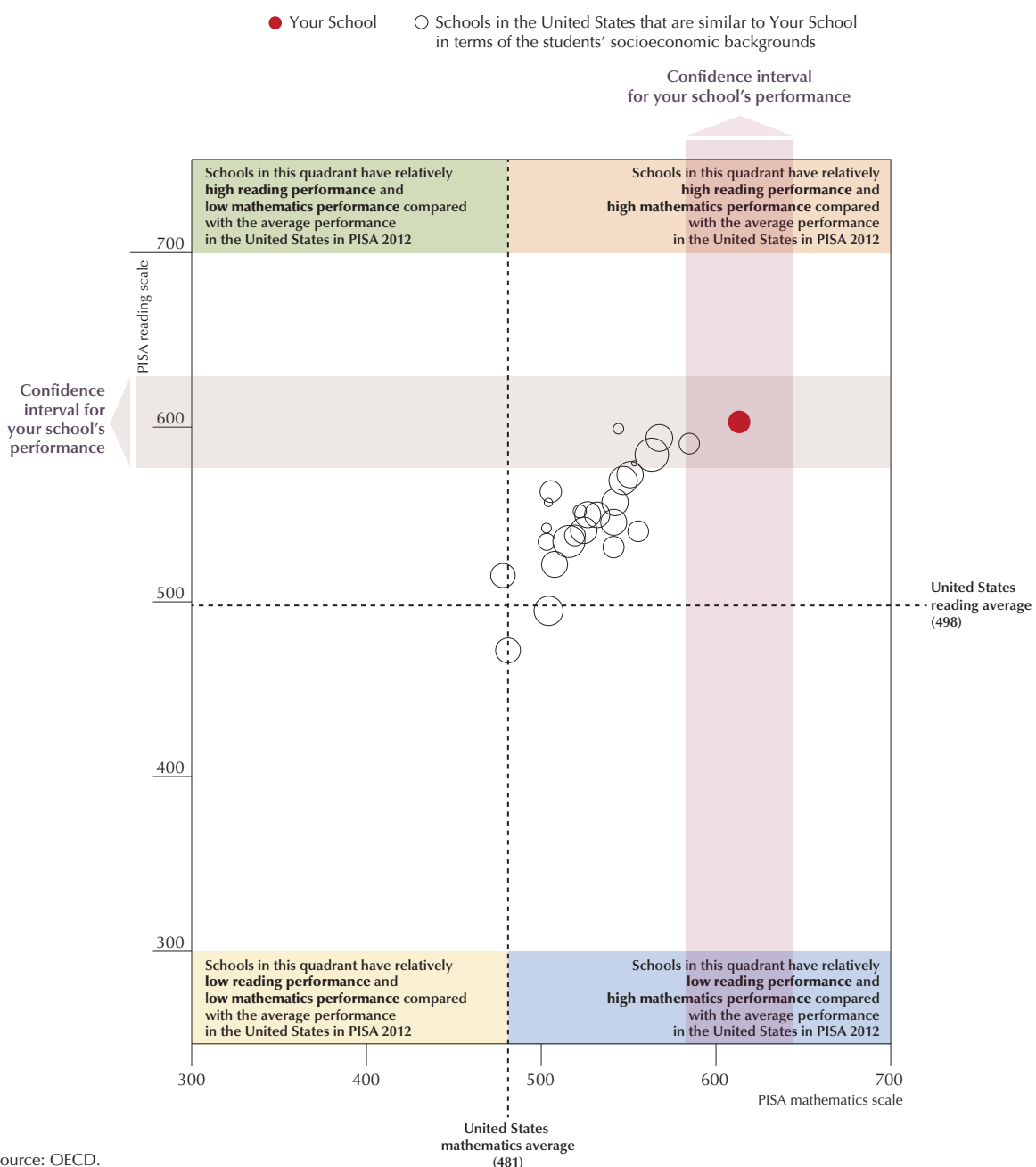
Figures 4.4a to 4.4c show how students at your school perform in reading, mathematics and science compared with schools with a similar socioeconomic background of students among the schools in the United States that participated in PISA 2012.

The similar schools (to your school) shown on these charts are the same schools as shown within the vertical gray band on the earlier Figures 4.1, 4.2 and 4.3. That is, similar schools in these charts are defined as serving students that are on average of a similar socioeconomic background as those attending your school. The number of similar schools depends on the number of schools that participated in PISA 2012 that serve students who have – on average – the same socioeconomic status as your school.

These figures are useful to identify the relative strengths and weaknesses of the students at your school in terms of their performance in reading, mathematics and science. Each of the three figures presents the performance results across **four quadrants** that are based on the average performance results for the United States in each area (e.g., reading, mathematics and science) in PISA 2012. That is, the lines that make up the quadrants are drawn by the lines that represent the average performance in your country for PISA 2012:

- Figure 4.4a maps **reading** results with **mathematics** results for your school, compared with similar schools in your country. In the upper-left quadrant, you'll find schools that have relatively *high* performance in reading but relatively *low* performance in mathematics compared with the average performance for your country. On the opposite part of the figure, in the lower-right quadrant, you'll find schools that have relatively *low* performance in reading but relatively *high* performance in mathematics. The upper-right quadrant shows schools that have relatively *high* performance in both reading and mathematics, while the lower-left quadrant shows schools that have relatively low performance in both subjects.

Figure 4.4a ■ **How your school's performance compares with similar schools in the United States in reading and mathematics in PISA 2012**



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- Figure 4.4b maps **reading** results with **science** results for your school, compared with the group of similar schools.
- Figure 4.4c maps **mathematics** results with **science** results for your school, compared with the group of similar schools.

Figure 4.4b ■ **How your school's performance compares with similar schools in the United States in reading and science in PISA 2012**

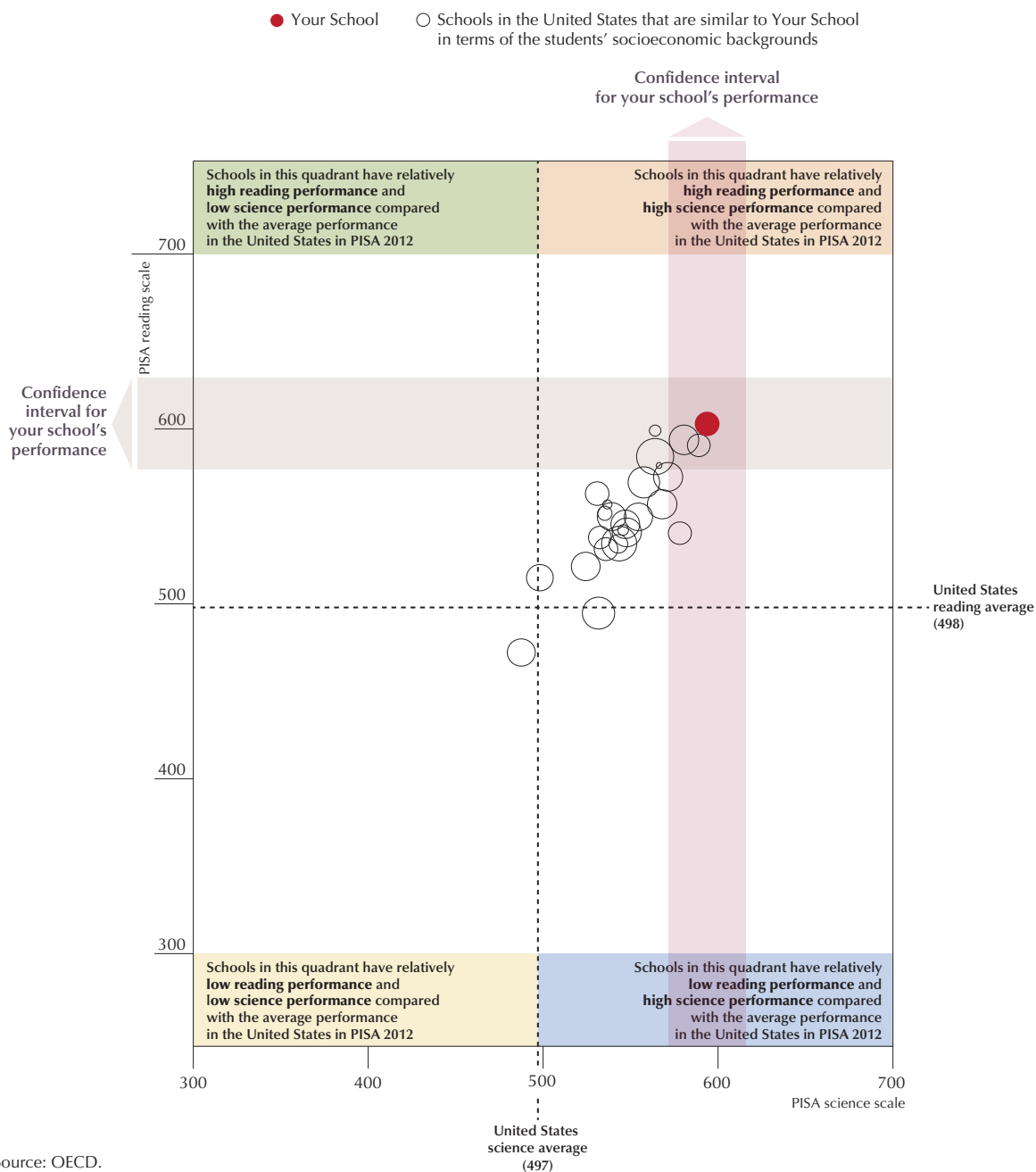
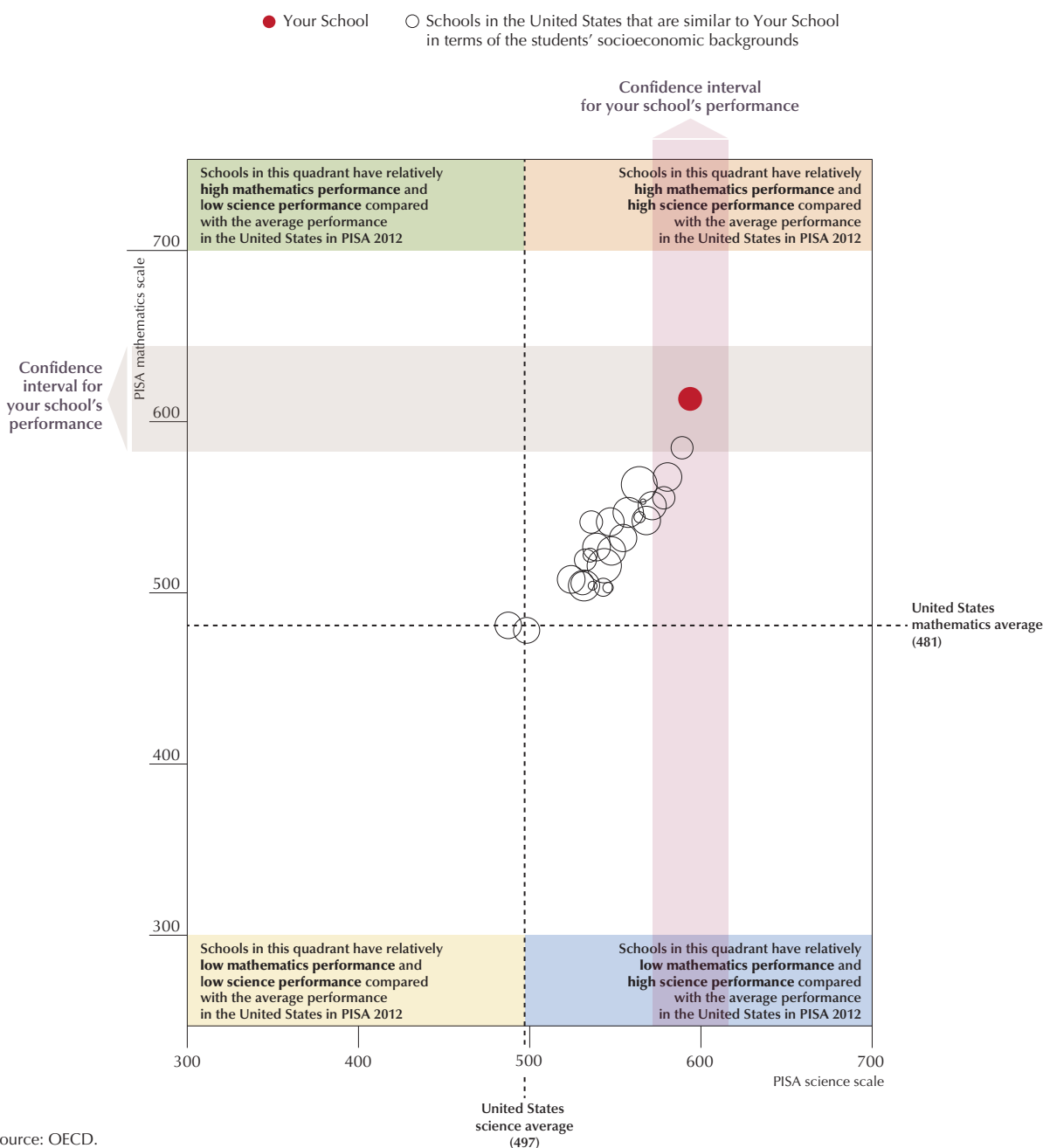


Figure 4.4c ■ **How your school's performance compares with similar schools in the United States in mathematics and science in PISA 2012**



Source: OECD.

If your school clearly shows stronger performance in some subjects relative to others, then it might be useful to reflect upon these differences: Do the relative strengths and weaknesses mirror what would be expected given the school's focus areas? Do the students at your school demonstrate potential for improvement in one or more subject areas that would need to be recognized and addressed? What efforts could be taken to raise student performance in those subjects where student performance seems to be weaker relative to others? To support reflection and discussion on these and related questions, it is useful to also look at the distribution of students in proficiency levels as shown on Figures 2.5, 2.8 and 2.11 earlier in the report and on the descriptions of the competencies and skills associated with each level of proficiency.

YOUR SCHOOL'S RESULTS COMPARED WITH PUBLIC AND PRIVATE SCHOOLS IN THE UNITED STATES

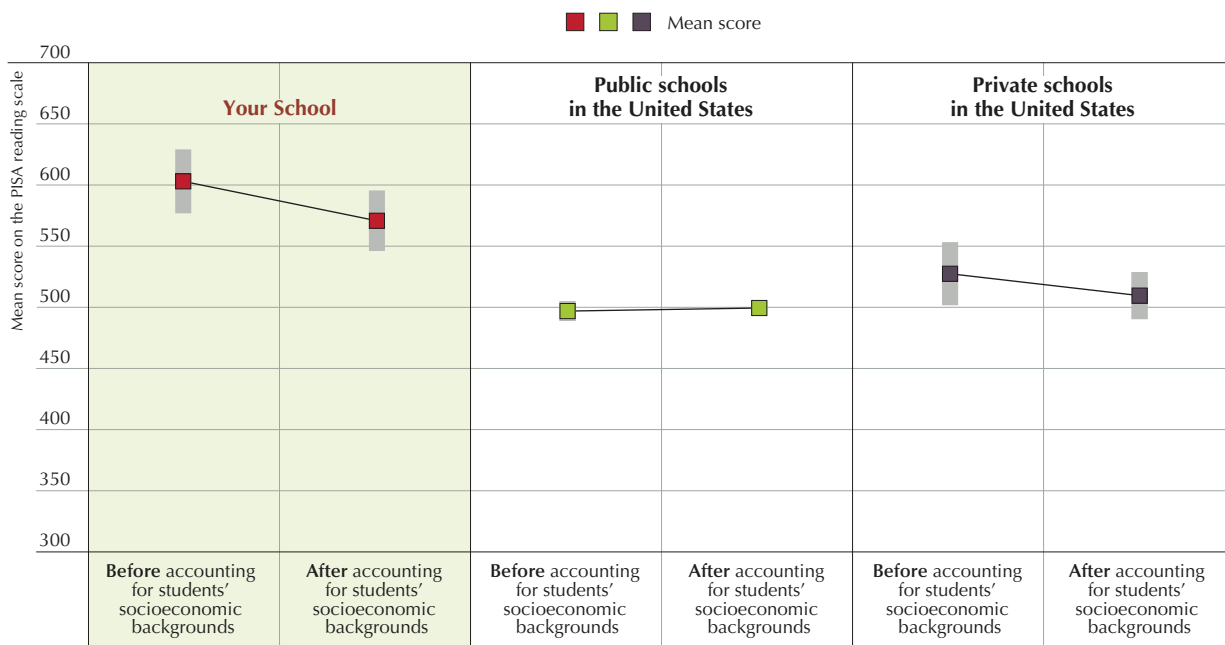
Students who attend private schools tend to perform better than those who attend public schools. This is the case in most countries that participate in PISA, including Canada, the United Kingdom and the United States. In most of these countries, however, this difference cannot be attributed solely to differences in the quality of instruction, but also to the fact that students in private schools on average come from more advantaged socioeconomic contexts than students in public schools.

Figures 4.5a to 4.5c show how students in your school perform in reading, mathematics and science compared with students in public schools and private schools in the United States in PISA 2012.

For your school and for the public and private schools in PISA 2012, the figures show two values connected by a blue line. The markers on the left-hand side of the line represent the actual performance of students, without accounting for their socioeconomic backgrounds. When looking at the figures, it is worth focusing first on these values. You will notice that the value on the left-hand side for your school is the mean score of your school that has been presented previously in this report.

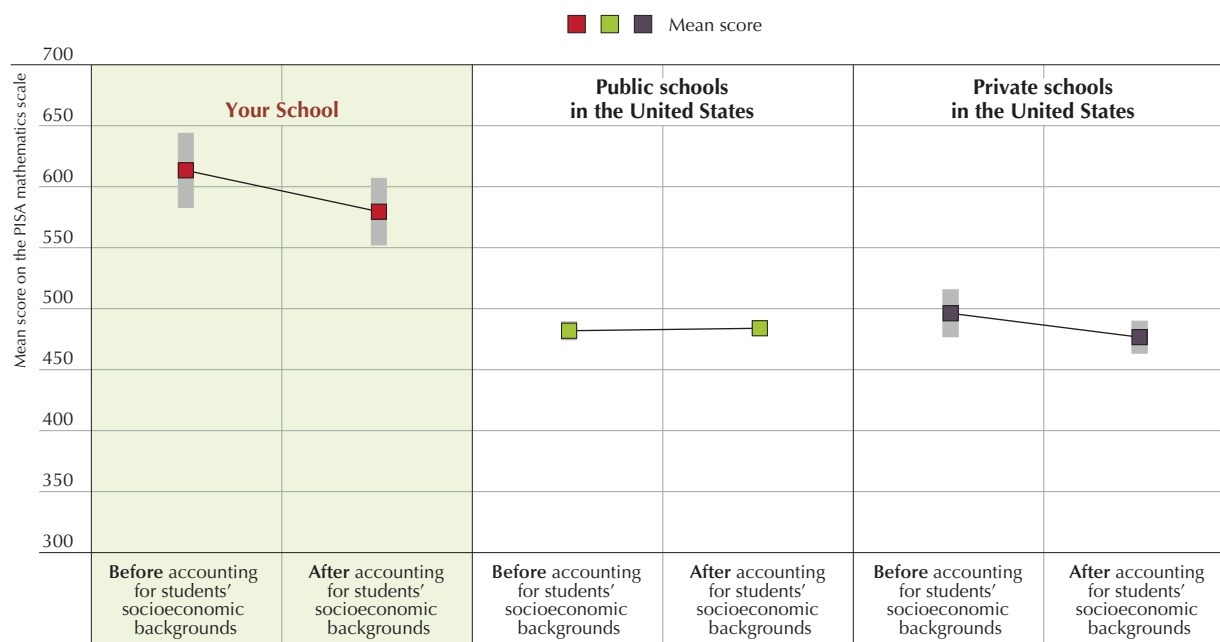
Moving on to public and private schools in the United States, you will notice from the left-hand values that students in private schools perform better than students in public schools in all three subjects. In PISA 2012, the difference is not significant, but is still apparent. In reading, students in public schools have a mean score of 497, while students in private schools have a mean score of 527, a difference of 30 score points. In mathematics, the gap between public and private schools is 14 points, with students in public and private schools performing at 482 points and 496 points, respectively. In science, the gap is 20 points, with students in public and private schools performing at 498 and 518 points, respectively.

Figure 4.5a ■ How your school's performance in reading compares with public and private schools in the United States in PISA 2012



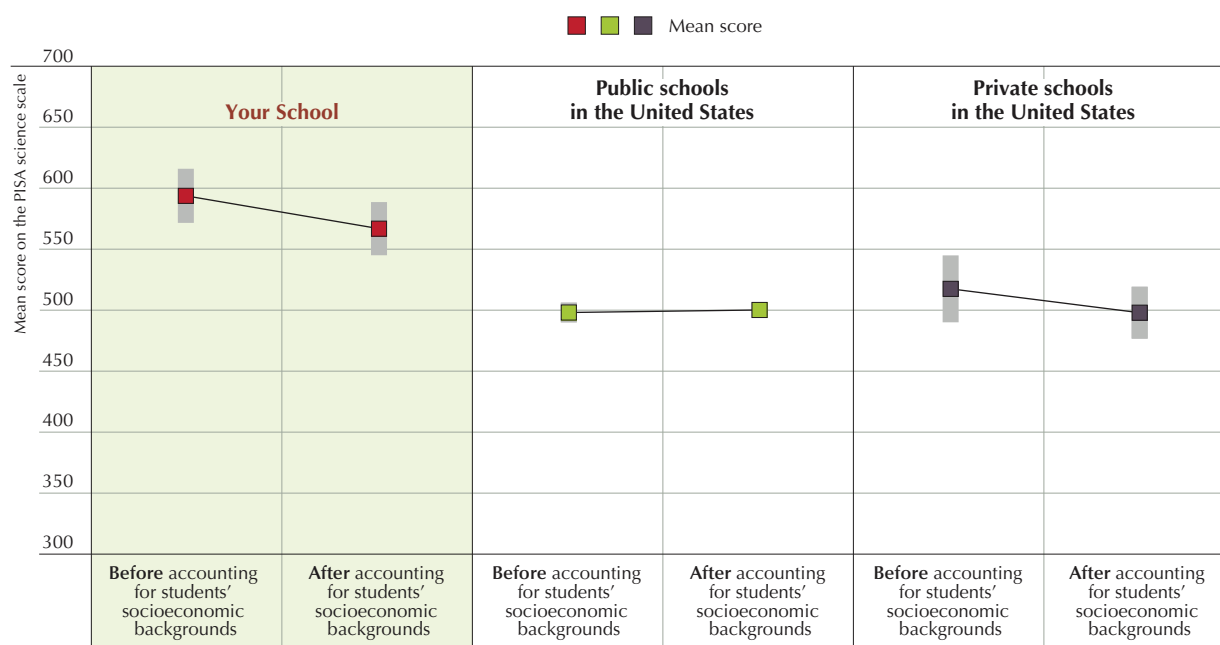
Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance score would fall within this confidence interval. Source: OECD.

Figure 4.5b ■ How your school's performance in mathematics compares with public and private schools in the United States in PISA 2012



Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance score would fall within this confidence interval. Source: OECD.

Figure 4.5c ■ How your school's performance in science compares with public and private schools in the United States in PISA 2012



Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance score would fall within this confidence interval. Source: OECD.



But what does the performance of these schools look like if one were to try to “factor out” the relative socioeconomic advantage – on average – of students who attend private schools?

The values on the right-hand side of the blue lines are the mean scores after taking into account the socioeconomic backgrounds of the students. These values are helpful in considering the relative performance of your school and of public and private schools in general. They provide the answer to the questions: How would students in your school have performed if they had had a socioeconomic background similar to the average students in the country? And how would students in public or private schools have performed if these types of schools had had student intakes similar to the average of the country?

The figure shows that for public schools in the United States, the average student performance does not change very much when taking into account the students' socioeconomic backgrounds. For private schools, however, the performance is significantly *lower* when taking into account the students' socioeconomic backgrounds. Five percent of students in the United States attend private schools, and on average they come from more advantaged backgrounds than those in public schools. When taking into account the more advantaged background of the student intake, the results for the private schools decrease from 527 to 510 points in reading, from 496 to 477 points in mathematics, and from 518 to 498 points in science. The results decrease because private schools on average serve students from more advantaged backgrounds than do public schools.

Furthermore, private schools in the United States produce students who perform slightly better than students who attend public schools. Once the socioeconomic status is taken into account, however, public and private schools do not show a marked difference in performance and students from public schools actually outperform students from private schools. You can learn more about student performance in public and private schools in the four-page note [PISA in Focus 7: Private schools: Who benefits?](#)

When looking at these figures it is useful to note that the average socioeconomic status of students in the United States is only slightly higher than the OECD average. In other words, students there are on average slightly more advantaged than those across OECD countries. Thus, when adjusting for the students' socioeconomic status, the average performance of the United States in mathematics does not significantly change. In contrast, in Shanghai-China, not only did students perform better on average (613 score points), but after taking into account the socioeconomic status their score would actually *increase* – meaning that not only are there more students who come from disadvantaged socioeconomic backgrounds in Shanghai-China, but they also perform better than students from the United States who come from similar and socioeconomically advantaged backgrounds. Also, when looking more closely at the impact of a student's socioeconomic status in the United States, a student who is 1 point higher than another student on the socioeconomic and cultural status scale (i.e., 1 standard deviation higher than the OECD average) will score 35 points higher on average, almost equivalent to an advantage of one full year of school (41 score points).





Box 4.2 **Resilient students who succeed against the odds: Lessons from PISA**

PISA considers students resilient when they come from the bottom quarter of the distribution of socioeconomic backgrounds in their country and score in the top quarter among students from all countries with similar socioeconomic backgrounds.¹

When policy leaders and educators look at learning outcomes of students from disadvantaged backgrounds, they often ask: *Why is it that some students, even though they come from disadvantaged socioeconomic backgrounds, are able to beat the odds and outperform their peers?*

To try to answer this question and provide relevant insights for schools and educators, PISA looked closely at the performance of these students in the 2006 cycle, when science was the main assessment area. PISA 2006 looked into the factors that contribute to some students from disadvantaged backgrounds continually being among the highest-performing students. These students are recognized by PISA as resilient. The following are some of the insights from PISA 2006 regarding students' higher performance despite their disadvantaged socioeconomic backgrounds.

- ***Investing more time in learning is a very important factor for students from disadvantaged socioeconomic backgrounds.*** PISA shows that students from disadvantaged backgrounds do not enjoy as much learning time in school as those who come from advantaged backgrounds.
- ***Along with more learning time in school, time spent learning science correlates strongly with better performance across the board.*** Students from disadvantaged backgrounds who take one hour extra of regular science classes are 1.27 times more likely to be resilient than other disadvantaged students who do not have this opportunity. Taking more general science classes benefits disadvantaged students even much more so than those who come from an advantaged background. Therefore, introducing compulsory science classes such as physics, biology and chemistry into the core curriculum of disadvantaged students might help close the performance gap with students who come from more advantageous backgrounds.
- ***A positive outlook on learning and more confidence in their ability might also help students who come from disadvantaged backgrounds.*** PISA results show that on average across OECD countries, *self-efficacy* has the strongest association with *resilience*. Students who believe in their own ability to handle tasks effectively and overcome difficulties are almost twice as likely (1.95 times more) to be resilient than disadvantaged students with low levels of self-efficacy. Policies that focus on disadvantaged students' confidence overall might be effective, as students who come from disadvantaged backgrounds might not receive enough support outside the classroom.

Schools may have an important role in promoting resilience among students by developing activities, classroom practices and modes of instruction that foster disadvantaged students' motivation and confidence in their abilities. Additionally, disadvantaged students do not often have the opportunity to take general science classes, thereby increasing the potential for widening performance gaps (OECD, 2011a).

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1. OECD (2013c), [PISA 2012 Results: Excellence through Equity: Giving Every Student the Chance to Succeed \(Volume II\)](#), OECD Publishing, Paris.

Ultimately, targeted policies addressing some of the issues identified by PISA with regard to resilient students – such as developing modes of instruction that foster disadvantaged students' motivation and confidence in their abilities, as well as introducing more science classes to the curriculum – may be necessary in order to ensure that all students, including those from disadvantaged backgrounds, perform at high levels.

To find out more about what educators and policy makers can do to foster high performance among students from disadvantaged backgrounds, go to:

- [PISA in Focus 5: How do some students overcome their socioeconomic background?](#)
- [Against the Odds: Disadvantaged Students Who Succeed in School](#)

Sources: Education Today (2011), *"Can Disadvantaged Students Beat the Odds against Them?"* OECD Publishing, Paris, 8 February 2011.

OECD (2013c), *PISA 2012 Results: Excellence through Equity: Giving Every Student the Chance to Succeed (Volume II)*, OECD Publishing, Paris.

OECD (2011a), *Against the Odds: Disadvantaged Students Who Succeed in School*, OECD Publishing, Paris.

The comparatively close relationship between the learning outcomes of students in the United States and socioeconomic background is not simply explained by a more socioeconomically heterogeneous student population or society but, as noted before, mainly because socioeconomic disadvantage translates more directly into poor educational performance in the United States than is the case in many other countries.

If social inequities in societies were always closely linked to the impact of social disadvantage on learning outcomes, the role of public policy in improving equity in the distribution of learning opportunities would be limited, at least in the short term. However, there is almost no relationship between income inequalities in countries and the impact of socioeconomic background on learning outcomes. Some countries succeed, even under difficult conditions, to moderate the impact of socioeconomic background on educational success.

The OECD Adult Skills Survey (OECD, 2013f) shows that higher levels of inequality in literacy and numeracy skills are associated with greater inequality in the distribution of income, whatever the causal nature of this relationship. If large proportions of adults have low reading and numeracy skills, the introduction and wider diffusion of productivity-improving technologies and work organization practices can be hampered and that, in turn, will stall improvements in living standards. In other words, today's education is tomorrow's economy.



Box 4.3 **Effectively supporting disadvantaged students and schools: Examples from Canada, Ireland and Shanghai-China**

Schools and educators in many countries face the challenge of answering the following questions: *What are effective policies and practices to improve equity and reduce school failure? What are the specific challenges facing schools with high proportions of students from disadvantaged backgrounds?*

The OECD has identified various approaches that educators use to effectively support disadvantaged schools. These include developing specialized school leadership; fostering a supportive school environment; recruiting, developing and supporting high-quality teachers; and linking parents and communities with schools to increase student learning outcomes (OECD, 2012b). Some insights on policies and practices to support disadvantaged students and schools include the following:

- Evidence suggests that the starting point for transforming the lowest-performing disadvantaged schools is to ***strengthen and support school leadership***. Yet, school leaders are not always adequately trained or given systemic support and better working conditions to respond to the needs of these schools and their students. Effective leadership entails a combination of internal and external development that includes: supporting and developing teacher quality; goal-setting and accountability for school leaders, teachers and students; and collaborating with other schools by forming networks where school leaders can share strategies.
- In addition, ***a positive and supportive school environment is important***. Disadvantaged schools face a greater risk of student behavior problems in the classroom that negatively affect learning. Policies need to ensure that disadvantaged schools are able to create an orderly and co-operative effective learning environment. Improving positive teacher-student and peer relationships *while avoiding an emphasis on discipline alone* will encourage students to identify positively with school.
- Another important strategy is to ***develop a support system for teachers in disadvantaged schools*** to ensure that they gain the skills and knowledge they need to effectively work with students in these contexts. Well-structured programs that focus on diagnosing student problems and understanding the context of the schools where they learn facilitate teacher effectiveness (OECD, 2012b). Support from principals and school leadership, collaboration with colleagues and adequate resources will also encourage teachers to be more engaged and remain at the same school to see the fruit of their efforts.
- ***Experienced educators have also stressed the importance of linking schools with parents and communities***, as disadvantaged parents tend to be less involved in their children's schooling for multiple economic and social reasons. Engaged parents encourage more positive attitudes toward school, improve homework habits, reduce disengagement and enhance academic achievement.

To illustrate some of these strategies, the following are examples of policies and practices from Canada, Ireland and Shanghai-China that have proved effective in supporting disadvantaged schools and students.

Strengthening school leadership in Ontario, Canada

In 2003, the Ontario Ministry of Education launched the Student Success/Learning to 18 Strategy, which focuses on providing engaging, quality learning opportunities for all students and support for students at risk of not graduating (OECD, 2011c). One of the main objectives was to promote

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strong leadership in schools and district school boards, with the aim of changing school culture and achieving long-term improvements. New roles at the district and school levels were created in an effort to provide high-quality learning opportunities for all students and to support those at risk of not completing secondary education. At the district school-board level, the Student Success Leader was created to build leadership capacity. At the school level, the role of Student Success Teacher provides support to students at risk of leaving school, while a Student Success Team (which includes school leaders, Student Success Teachers and staff) tracks and addresses the needs of disengaged students. As a result of these efforts focusing on students who are at risk of not completing secondary school, the overall graduation rate in Ontario has increased by more than 10% since 2003 (OECD, 2011c).

Teacher-to-teacher support in Shanghai-China

Shanghai-China, a city with 754 general secondary schools (Shanghai Education, 2011), provides an excellent example of valuable teacher support. All new teachers participate in workshops, mentoring and peer observation; they also analyze lessons in groups with experienced teachers. Teachers are able to join teaching research groups in order to discuss techniques. They also must observe experienced teachers conduct lessons in their classroom at least eight times a semester, while new teachers are also observed and given advice on how to improve their lessons and teaching strategies. Experienced as well as new teachers talk through lesson plans and explain their methods and approaches to the lesson plans. These types of strategies illustrate how teachers can help each another effectively (OECD, 2012b).

Working with parents and communities in Ireland

Ireland has a Home/School/Community Liaison Program (HSCL), targeted at students at risk, which focuses directly on the most important adults in children's educational lives. The program establishes partnerships with parents and teachers and organizes locally based activities to encourage greater contact among parents, teachers and local volunteer groups in order to tackle issues that focus on children at risk of not reaching their potential in the education system. Approximately 155,000 students attending 545 schools have access to this service (OECD, 2012b).

Disadvantaged students within schools

The students most likely to attend disadvantaged schools mainly come from lower socioeconomic backgrounds. Results from PISA 2006 show that factors such as whether a school is private or public, competition among schools for the highest-performing students and whether a school has good educational resources do not significantly affect disadvantaged or advantaged students' performance (OECD, 2011a).

There are, however, effective policies that help raise disadvantaged students' performance and provide them with more opportunities to live up to their full potential:

- ***One way is by reducing the number of students who repeat a school year.*** Grade repetition is costly and often ineffective in raising educational outcomes (OECD, 2012b). In addition, in systems where more than 10% of students have repeated a grade, students obtain an average of 19 score points fewer than systems where fewer than 10% of students have repeated a grade (OECD, 2010i). The most effective strategy to address learning gaps and avoid repetition is to tackle them during the school year by providing early, regular and timely support and evaluation.

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- ***Avoid early tracking and defer student selection to upper secondary education.*** Early student selection has a negative impact, especially on students from disadvantaged backgrounds, as they would most likely be placed in the least academically oriented tracks or groups and thus would have lower self-esteem and would not benefit from the positive effects of being around more capable peers.
- ***Overall, strengthening students' motivation, discipline and confidence helps eliminate barriers such as behavioral problems and grade repetition.***
- ***Investing in high-quality early child education and care significantly benefits students, including those from disadvantaged socioeconomic backgrounds.*** PISA results show that students from disadvantaged backgrounds who attend pre-primary education for more than one year are more likely to complete secondary education, as acquiring early skills and knowledge makes it easier to acquire skills and knowledge later on (OECD, 2012b). Investing early on to close disparities and prevent achievement gaps, therefore, may be more advantageous than trying to remedy disparities later, when they are harder and more expensive to correct.

To find out more about how educators, policy leaders and communities can help disadvantaged schools and students succeed, go to:

- [*Equity and Quality in Education: Supporting Disadvantaged Students and Schools*](#)
- [*PISA in Focus 13: Does money buy strong performance in PISA?*](#)
- [*PISA in Focus 1: Does participation in pre-primary education translate into better learning outcomes at school?*](#)
- [*Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*](#)

Sources: OECD (2010i), [*PISA 2009 Results: What Makes a School Successful? Resources, Policies and Practices \(Volume IV\)*](#), OECD Publishing, Paris.

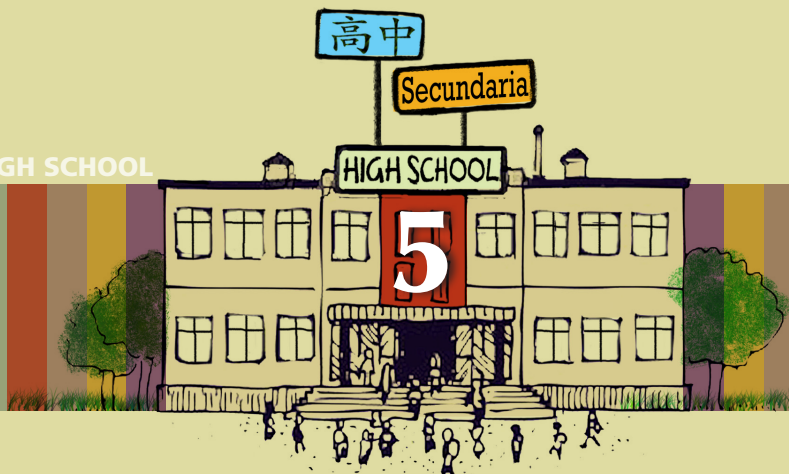
OECD (2011a), [*Against the Odds: Disadvantaged Students Who Succeed in School*](#), OECD Publishing, Paris.

OECD (2011c), [*Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*](#), OECD Publishing, Paris.

OECD (2012b), [*Equity and Quality in Education: Supporting Disadvantaged Students and Schools*](#), OECD Publishing, Paris.

Shanghai Education (2011), [*"A Survey of Basic Education In Shanghai"*](#), Shanghai Municipal Education Commission.





Your School's Results in an International Context

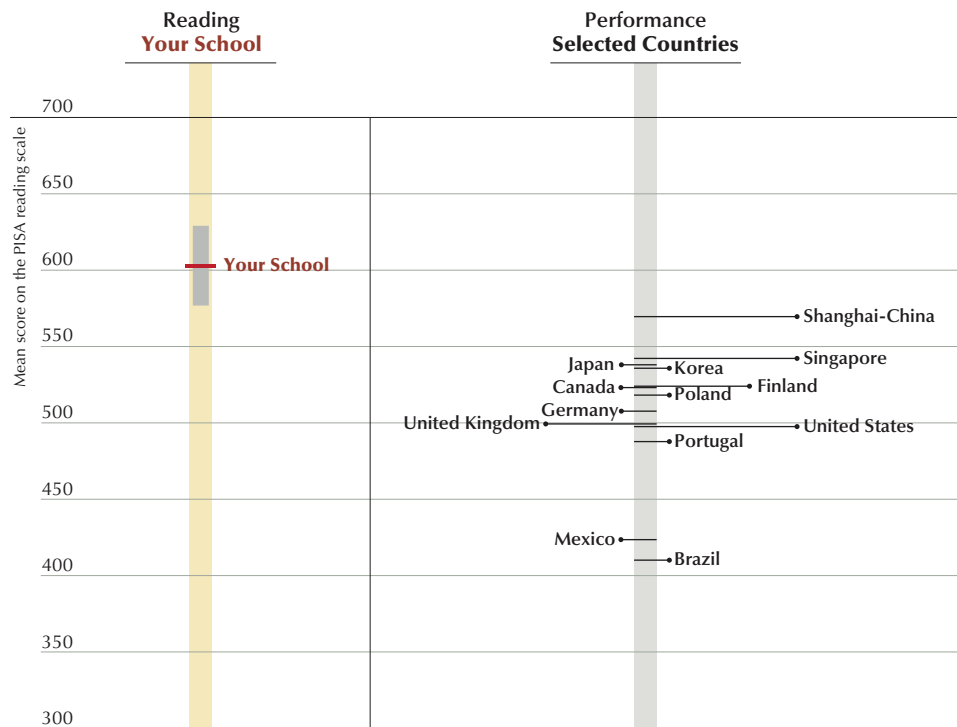
How do students at your school compare internationally? This section places your school's performance in the context of a selected group of 12 countries and education systems from around the world, most of which are the highest-performing or have undertaken significant reforms and have seen rapid improvements in learning outcomes as measured by the main PISA studies. The section first looks at reading results for your school and compares them with those of students and schools in other countries. The section then focuses on mathematics performance, followed by science. Examples of how education systems have implemented school improvement, tackled low performance and fostered the talent of students are included throughout the section, and several additional examples from around the world are presented at the end of the section.



The school-level assessment that your school participated in provides mean performance results in reading, mathematics and science to be reported on the PISA scales. This allows your school's results to be compared with results for students in schools around the world that participated in PISA 2012. Although 65 countries and economies participated in PISA 2012, a group of 12 comparison countries has been selected in order to provide an international context for understanding your school's results as described in Box 5.1.

In Figure 5.1, your school's mean performance results in reading are presented on the PISA scales (score points on the vertical axis on the left-hand side of the figure) with the 95% confidence interval for your school's mean score. On the right-hand side of the figure, the average results in reading in PISA 2012 for the group of 12 comparison countries and economies are also presented.

Figure 5.1 ■ **How students at your school compare with students from selected countries and economies in reading in PISA 2012**



Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance scores would fall within this confidence interval. Source: OECD.

YOUR SCHOOL'S PERFORMANCE IN READING IN AN INTERNATIONAL CONTEXT

Some of the comparison countries, such as Brazil, Canada, Germany, Mexico, the United Kingdom and the United States, have very large education systems with hundreds of thousands of 15-year-old students, and in some cases millions. Although average student performance in these countries can be summarized by average score estimates on the PISA scales (e.g., 523 in reading for Canada and 498 in reading for the United States), large variations of student performance exist behind these country scores.

Thus, to make meaningful comparisons of your school's mean performance score in reading, it is useful to look at how your school compares with groups of schools internationally. In Figure 5.2, your school's mean performance estimate is presented on the PISA reading scale along with the 95% confidence interval.

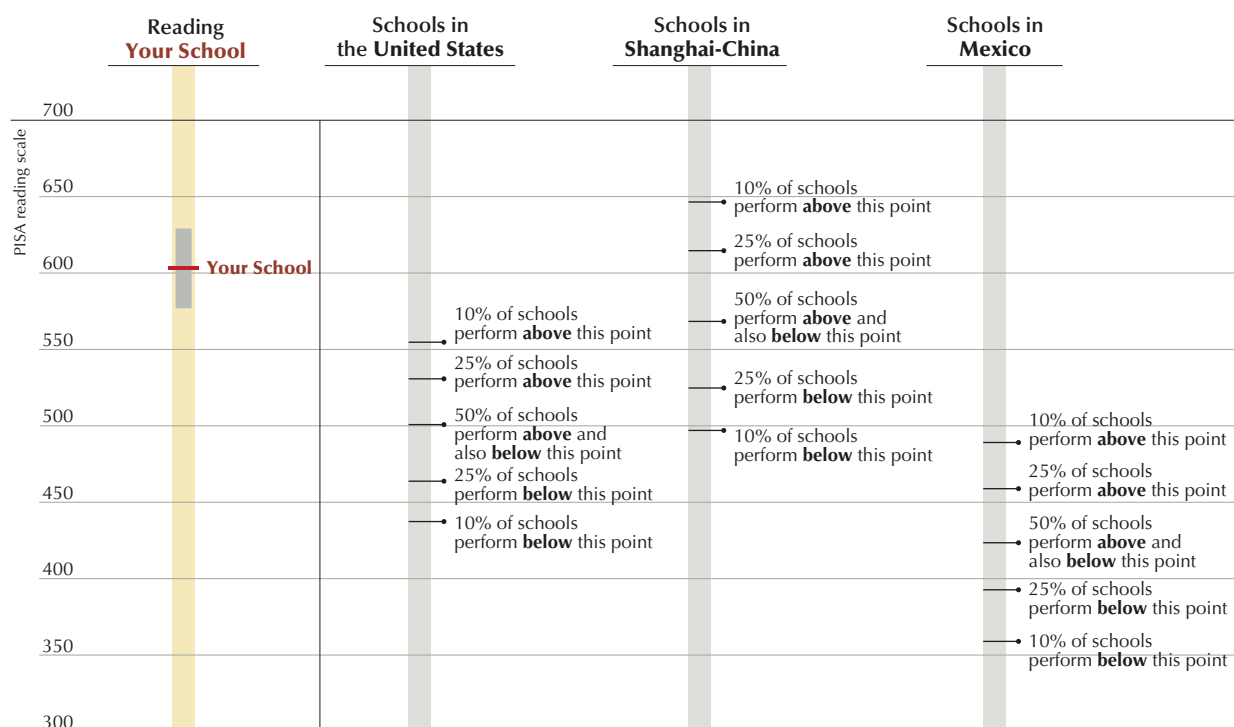
The performance of other schools in the United States, Shanghai-China and Mexico that participated in PISA 2012 are presented alongside your school's results.

For each comparison country/economy, five marks (horizontal marks) show how schools performed. The first mark at the top of each scale shows the cut-off score above which 10% of schools performed in that country. If your school's mean performance is above the first marker for your country, for example, then your school is among the top 10% of the highest-performing schools in your country.

The second marker from the top of the scales represents the score point above which the top quartile of schools performed. If your school's mean performance estimate is above the second marker for your country but not above the first 10% marker, for example, then your school is among the top 25% schools in your country but not among the top 10%.

The third and middle marker for each of the scales shows the point at which 50% of the schools perform *above* and 50% perform *below* for a given country. The two lower markers for each country show the points *below* which 25% and 10% of schools perform in that country based on PISA 2012 results. Given the large differences in student performance between the highest-performing economy in PISA 2012 – Shanghai-China – and the lowest-performing OECD country – Mexico – your school's mean performance estimates will correspond to very different percentiles within these economies.

Figure 5.2 ■ How your school compares with schools in other countries and economies in reading in PISA 2012



Notes: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance score would fall within this confidence interval. Schools are weighted by the number of students enrolled. For example, the legend "10% of schools perform above this point" refers to the highest-performing schools that account for 10% of the total number of students in the country.

Source: OECD.



Box 5.1 Education performance in PISA around the world: The group of comparison countries and economies highlighted in the school report

Most of the education systems referred to in this school report are those PISA considers as the highest-performing or that have undergone significant reforms and have seen rapid improvement in recent years. To make comparisons more meaningful, a group of 12 countries and economies is used for most of the comparisons presented in the report. The comparison group represents a wide range of education systems and models as well as diverse policies and practices that are relevant for school improvement efforts.

Trends in mathematics performance from 2003 to 2012 for the comparison countries included in this report

Statistically significantly **improved** performance in 2012 from 2003
 Statistically significantly **decreased** performance in 2012 from 2003
 Data are not available

	PISA mathematics scores				Percentage of students who performed below Level 2				Percentage of students who performed at Level 5 or above			
	2003	S.E.	2012	S.E.	2003	S.E.	2012	S.E.	2003	S.E.	2012	S.E.
Shanghai-China ¹			613	3.3			4	0.5			55	1.4
Singapore ¹			573	1.3			8	0.5			40	0.7
Korea	542	3.2	554	4.6	10	0.8	9	0.9	25	1.4	31	0.4
Japan	534	4.0	536	3.6	13	1.2	11	1.0	24	1.5	24	1.5
Finland	544	1.9	519	1.9	7	0.5	12	0.7	23	0.8	15	0.7
Canada	532	1.8	518	1.8	10	0.5	14	0.5	20	0.7	16	0.6
Poland	490	2.5	518	3.6	22	1.1	14	0.9	10	0.6	17	1.3
Germany	503	3.3	514	2.9	22	1.2	18	1.0	13	0.9	17	0.9
United Kingdom ¹			494	3.3			22	1.3			12	0.8
United States	483	2.9	481	3.6	26	1.2	26	1.4	10	0.7	9	0.8
Mexico	385	3.6	413	1.4	66	1.7	55	0.8	0.4	0.1	0.6	0.1
Brazil	356	4.1	391	2.1	75	1.7	67	0.8	1	0.4	1	0.2

Note: Countries appear in the table based on their mathematics performance in PISA 2012.

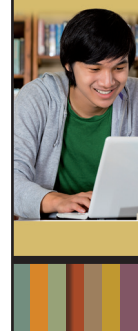
1. PISA results are not available for 2003 for the United Kingdom because the initial response rate fell short of the minimum requirements. Singapore and Shanghai-China did not participate in PISA 2003.

Source: OECD (2013b), *PISA 2012 Results: What Students Know and Can Do: Student Performance in Mathematics, Reading and Science (Volume I)*, OECD Publishing, Paris.

In many countries, better performance results were driven largely by improvements at the bottom end of the performance distribution – students performing below Level 2 – indicating progress toward greater equity in learning outcomes. Among countries where between 60% and 80% of students performed below Level 2 in 2003, Mexico and OECD partner country Brazil showed important decreases in the share of low performers. In mathematics, for example, Brazil decreased its share of low performers by 8% and Mexico by 11%.

In Germany and Poland, overall performance in mathematics improved, while the variation in performance decreased. This was the result of improvements among the lowest-achieving students. The proportion of top performers increased in Korea to one of the highest levels among 2012

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participants, by 6 percentage points (25% to 31%), the highest observed change in mathematics among participating countries. Poland and Germany saw improvements in the performance of their lowest-achieving students while maintaining the performance level among the highest-achieving students. In addition, Korea raised the reading performance of its highest-achieving students while maintaining the performance level among the lowest-achieving ones. In contrast, performance among Canada's highest-achieving students declined, while performance among its lowest-achieving students remained largely unchanged (OECD, 2010j).

Korea's experience demonstrates that even at the highest performance level, further improvements are possible. In 2000, with PISA reading performance at 525 score points, Korea was already performing above the OECD average along with several countries that had similar or even higher performance levels, including Canada, Japan and Finland (Finland being the highest-performing country that year). In 2012, while Finland's performance has declined, Korea continues to improve and now outperforms Finland and other high-performing economies. Korea's strong performance in PISA 2000 did not prevent its policy makers from believing that students needed to improve further to meet the changing demands of an internationally competitive labor market. As a result, *Korea's focus shifted from requiring proficiency in grammar and literature to encouraging skills and strategies needed for creative and critical understanding.*

Diverse teaching methods and materials that reflected those changes were developed, including investments in related digital and Internet infrastructure. The government also developed and implemented reading-related policies and requested schools to spend a fixed share of their budgets on reading education. Training programs for reading teachers were developed and distributed. Parents were not only encouraged to participate more in school activities, but were also given information on how to support their children's schoolwork. Socioeconomically disadvantaged students were given support through various afterschool reading, writing and mathematics courses that had been put in place at the end of the 1990s. The government established national measurement tools to monitor the quality of educational achievement and to ensure that all students had attained basic competencies. As of 2000 and 2006, Korea has significantly improved in both reading and science.


Poland's experience of educational improvement is also illustrative. In 2000, Poland's 15-year-old students averaged 479 score points on the PISA reading assessment, well below the OECD average of 500. Another troubling fact was that over 23% of students had not reached the baseline Level 2 in reading. Even before the release of the PISA results in 2000, plans were under way in Poland to improve learning outcomes. In 1998, the Polish Ministry of Education presented an outline of reforms to raise the level of education by increasing the number of people with secondary and higher education qualifications, ensuring equal educational opportunities and supporting improvements in the quality of education. The reform also covered health, the pension system and the delegation to local authorities of more responsibilities for education. The reform envisaged changes in the structure of the education system, reorganizing the school network and transportation; changes in administration and supervision methods; changes in the curriculum; a new central examination system with independent student assessments; the reorganization of school finances through local government subsidies; and new teacher incentives, such as alternative promotion paths and a revised remuneration system. For example, the period of general education, based on the same curriculum and standards for all students, was extended by one year. Only after completing three years of lower-secondary education would the student move on to a three- or four-year upper-secondary school that provided access to higher education or to a two- or three-year basic vocational school.

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In the new system, each stage of education ends with a standardized national examination, which gives students, parents and teachers feedback. Enrollment in higher education increased from roughly half a million students before 1993 to nearly 2 million 15 years later. This also transformed the environment in which newly established schools operated, with more parents committed to giving their children the best education and more students choosing schools carefully, taking into consideration future career prospects. Education became highly valued in Poland as the economic returns of a good education increased (OECD, 2010j).

To find out more about improvement in other education systems, go to:

-  [*Strong Performers and Successful Reformers in Education*](#)
- [*PISA 2012 Results: What Students Know and Can Do: Student Performance in Mathematics, Reading and Science \(Volume I\)*](#)

Sources: OECD (2001), [*Knowledge and Skills for Life: First Results from the OECD Programme for International Student Assessment*](#), OECD Publishing, Paris.

OECD (2010f), [*PISA 2012 Results: What Students Know and Can Do: Student Performance in Mathematics, Reading and Science \(Volume I\)*](#), OECD Publishing, Paris.

OECD (2010c), [*Lessons from PISA for Mexico, Strong Performers and Successful Reformers in Education*](#), OECD Publishing, Paris.

Because it is clear that students' socioeconomic backgrounds affect their learning outcomes, it is important to consider performance not in absolute terms but in light of the students' socioeconomic advantage or disadvantage. Continuing with the same idea of comparing your school's performance with that of schools in other countries and economies as opposed to whole education systems, the following Figures 5.3 and 5.4 show your school's performance results in reading in the context of the schools that participated in PISA 2012 in the highest-performing economy – Shanghai-China – and in the lowest-performing OECD country – Mexico. In addition to reading performance, the average socioeconomic status of students at these schools is shown in these figures to allow for meaningful comparisons.

As with the previous bubble charts introduced in Section 2 of the report, performance on the PISA scales increases from bottom to top (on the y-axis) and students' socioeconomic advantage increases from left to right (on the x-axis). As before, the x-axis shows the average index values of the PISA index of economic, social and cultural status (ESCS) from -3.0 (very disadvantaged) to +3.0 (socioeconomically advantaged). The scale used is calibrated so that the OECD average is 0.0 and plus or minus 1 is equivalent to 1 standard deviation from the OECD average.

Starting with the highest-performing economy in PISA 2012, Figure 5.3 shows your school's performance relative to the schools that participated in Shanghai-China. The figure shows that most of the students and schools in Shanghai-China have a lower socioeconomic status than the OECD average (0.0 on the charts), including that of the United States (0.17), the United Kingdom (0.27) and Canada (0.41). The average socioeconomic status of students in Shanghai-China is in fact -0.36. Another interesting point is that schools with high student enrollment – shown by the larger bubbles – tend to perform at or slightly below the trend line.

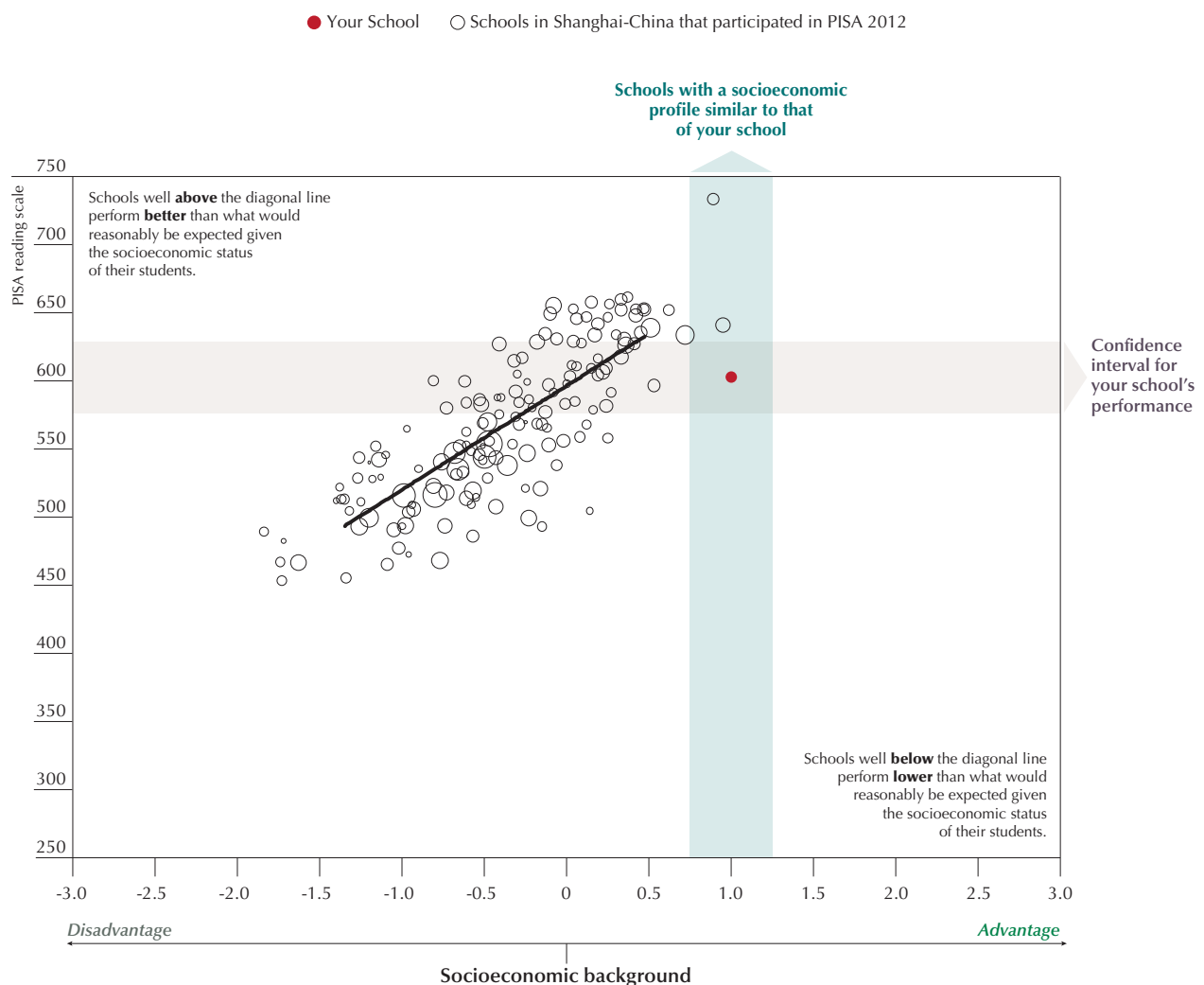
As with previous figures, it is important for you to consider your school's relative position not only vertically (i.e., on the performance scale) but also in terms of socioeconomic status vis-à-vis other schools.

This figure also shows that while the average performance in reading for Shanghai-China was 570 score points, students in many schools in Shanghai-China actually show results well above 600 points.

Schools with similar socioeconomic backgrounds to your school are indicated by the vertical *light-blue* band. The confidence interval for your school's results is indicated by the horizontal *gray* band. The size of the bubbles indicates the number of students enrolled at each school.

A diagonal trend line is also shown to help the reader understand school performance in relation to socioeconomic backgrounds. Schools above the diagonal line perform better than what would reasonably be expected given the socioeconomic status of their students. Schools below the line perform lower than what would reasonably be expected given the socioeconomic status of their students.

Figure 5.3 ■ **How your school's results in reading compare with schools in Shanghai-China in PISA 2012**



Note: Size of bubbles is proportional to the number of students enrolled at the school.
Source: OECD.



Box 5.2 What makes a school successful? Some lessons from PISA

***Success in terms of performance and equity:** According to the most recent PISA results, successful school systems are defined as those that perform above the OECD average in mathematics (494 points in 2012) and in which students' socioeconomic background has less of an impact on mathematics performance than in a typical OECD country. On average across OECD countries, 15% of the variation in mathematics scores is explained by socioeconomic background.¹*

PISA 2012 results identify several features of school systems that relate to student performance and equity in education. Factors such as how students are selected for entry into schools and classrooms; the extent to which individual schools are granted autonomy to make decisions on curricula and assessments; and whether schools are allowed to compete for student enrollment, as well as other factors such as accountability and feedback, all play an important role in the success of school systems across OECD countries.

World-class education systems such as those in Canada, Japan and Korea invest educational resources where they can make the greatest difference, they attract the most talented teachers into the most challenging classrooms and they establish effective spending choices that prioritize the quality of teachers (OECD, 2013e). The following approaches highlighted in PISA 2012 results are utilized by educators and policy makers for successful schools:

- **Successful systems are equitable.** School systems where all students, regardless of their socioeconomic background, are offered similar opportunities to learn and to attend the same schools and where students rarely repeat grades are more likely to perform above the OECD average.

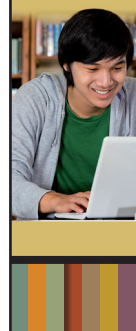
Results from PISA also show that parents and students who are able to choose among schools *while not being constrained by financial or logistical considerations* relate positively to equity in education. Thus, local education systems considering policies with regards to school choice should consider the different aspects involved with school choice and competition, such as modes of transportation to and from school for students from disadvantaged backgrounds or providing waivers for student fees.

In addition, students in schools where no ability grouping is practiced scored eight points higher in mathematics in 2012 compared to their counterparts in 2003, while students in schools where ability grouping is practiced in some or all classes had lower scores in PISA 2012 than their counterparts in PISA 2003.

- *School systems that allow schools more autonomy over their curriculum and allocation of resources, while limiting school competition for students, are more likely to perform above the OECD average and to show below-average socioeconomic inequalities.* School systems that also grant schools greater discretion in establishing student disciplinary policies and in deciding student-assessment policies, the courses offered, the content of those courses and the textbooks used are those systems with higher mathematics scores overall.
- **Accountability goes hand in hand with school autonomy.** PISA results show that in school systems where most schools post student-achievement data publicly, average student performance is marginally higher in schools that also have autonomy over resource allocation.

However, standardized tests might have the adverse effect of schools focusing only on achieving passing or proficient results on tests. In order to break away from this negative impact of "teaching to the test," countries should not merely focus on student assessments, but also evaluate schools and appraise teachers and school leaders. All school staff and students need to be engaged in a broader range of evaluation exercises, targeting both schools and teachers (OECD, 2013a).

1. OECD (2013a), *PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices (Volume IV)*, OECD Publishing, Paris. ...




- Across all countries and economies that participated in PISA 2012, *the extent to which schools provide an opportunity for teacher mentoring is also related to equity*. In systems where more schools provide teacher mentoring, students' socioeconomic status has less impact on their performance.
- *Schools that ask for continual feedback from their students also report higher results*. PISA 2012 shows that the degree to which systems seek feedback from students regarding lessons, teachers or resources tends to be related to systems' level of equity. Systems where more students attend schools with such practices tend to show less impact of student socioeconomic status on performance. At the school level, on average across OECD countries, schools seeking written feedback from students tend to perform better, even after accounting for the socioeconomic status of students and schools.

Placing a high value on education is very important for success but can only get a country so far if the teachers, parents and citizens of a country believe that only a segment of the nation's children can or need to meet high standards. Systems that show high performance and an equitable distribution of learning outcomes tend to be comprehensive and have a more positive outlook on every student's ability to succeed, requiring teachers and schools to embrace diverse student populations through personalized educational pathways.

Equity in schools in Finland

Finland provides an excellent example of a thriving school system that embraces equity and diversity. Equality in educational opportunities lies at the heart of Finland's education policy. Education policies emphasize equity and well-being in schools and rely upon the principle of inclusive education. The aim is for all children to find their neighborhood school sufficient and appropriate to their needs and to their parents' expectations. However, parents still have freedom to choose any school in their own municipality. While assessment practice is grounded in the national curriculum, education policy in Finland gives a high priority to individualized education and creativity as an important part of how schools operate. Thus, each student is judged more against his or her individual progress and abilities than against statistical indicators (OECD, 2012d).

To find out more about what makes schools successful, go to:

- [PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices \(Volume IV\)](#)
- [Lessons from PISA 2012 for the United States, Strong Performers and Successful Reformers in Education](#)
-  [Strong Performers and Successful Reformers in Education: Maintaining a strongly supportive school system in which teachers and students share responsibility for results](#)
- [PISA in Focus 34: Who are the strong performers and successful reformers in education?](#)

Sources: OECD (2012d), [Lessons from PISA for Japan, Strong Performers and Successful Reformers in Education](#), OECD Publishing, Paris.

OECD (2013a), [Lessons from PISA 2012 for the United States, Strong Performers and Successful Reformers in Education](#), OECD Publishing, Paris.

OECD (2013e), [PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices \(Volume IV\)](#), OECD Publishing, Paris.

As with previous bubble charts, it is important to consider your school's relative performance vis-à-vis other schools and to identify schools that might be performing at the level of your school but with a much lower average socioeconomic status or those that have a similar socioeconomic status on average but that may be performing *well below* or *well above* your school.



At the other end of performance, Figure 5.4 presents your school's mean performance estimate and average socioeconomic status of students in the context of the schools and students that participated in Mexico in PISA 2012. From looking at this figure, the reader may notice the following:

- There are many more schools represented in this figure for Mexico than in similar figures for the United States and Shanghai-China. This is because Mexico has one of the largest student and school sample sizes in PISA 2012: more than 33,000 students from 1,468 schools.
- As with nearly all of the countries and economies that participated in PISA 2012, student performance is strongly correlated with socioeconomic status. Although the average status of students is -1.11 in Mexico compared with the average of 0.0 among OECD countries, performance tends to increase as students come from more socioeconomically advantaged backgrounds, as shown by the linear trend line in the figure.

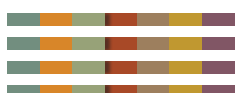


Figure 5.4 ■ **How your school's results in reading compare with schools in Mexico in PISA 2012**



Note: Size of bubbles is proportional to the number of students enrolled at the school. Twenty-three schools are not shown on the graph because their results are outside of the axis range.
Source: OECD.

- Although there is a large amount of variance in reading performance, no schools reach performance levels above 600 score points, and there is very large variance in terms of schools' average socioeconomic status – so much so that the common scale used throughout the report of -3.0 to +3.0 does not cover several schools that fall below -3.0.
- In contrast to Shanghai-China, the very large schools (represented by larger bubbles) typically perform above the trend line for Mexico – mirroring the relative performance of schools in urban centers versus smaller schools in rural or semi-urban settings.
- Figure 5.4 also graphically shows that while the average performance in reading of Mexico in PISA 2012 was 424 score points, more than 25% of the schools have a performance result below 400 points.



Box 5.3 **School-to-school learning: How effective schools support other schools in Shanghai-China**

Shanghai-China became the topic of discussion for many educators after PISA 2009 results showed it to be one of the highest-performing education systems in the world. The success of the education system is shown by its PISA 2009 results in reading, mathematics and science that exceed those of all OECD countries. The superlative performance of Shanghai-China in PISA challenged the notion held by many educators that learning in China is based only on rote, with no room for innovation or critical thinking (OECD, 2011c).

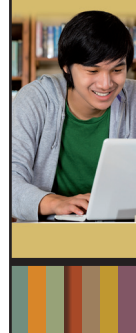
The success of Shanghai-China did not occur overnight. Since the late 1990s, Shanghai has been a crucible for educational experimentation, with its vision of broadening students' learning experiences and developing "capability" rather than accumulation of information and knowledge. By eliminating public examinations at the end of primary schooling, Shanghai released elementary students from the exam pressure that is still a pervasive feature in much of Chinese education, thus allowing teachers to introduce more innovation and creativity in their classrooms.

Focusing on disadvantaged schools, Shanghai also established a system of financial transfer payments that utilized public funding for schools in rural areas lacking in resources. Teachers and principals were transferred from urban to rural areas and vice versa, not only to raise the standard of staffing in disadvantaged schools, but also to introduce teachers and principals from rural schools to urban education systems so that they could return to their districts with fresh ideas.

Some of the most ambitious projects leading to Shanghai's success have drawn on the strengths of the best-performing schools by getting them to take responsibility for leading improvements at weaker schools. One recent development implemented among schools involves putting together a team of experienced teachers and administrators from strong schools and sending them to work directly with weaker schools to improve the school environment, including management style and teaching effectiveness.

Yet another approach creates clusters in which two or more schools in a specific area are grouped together, whether they are private or public, with a strong school at the core. The district education authority provides funding, and an external evaluation body assesses the results of the project. Within this group of schools, the strong school provides ideas on management and teaching effectiveness and as a result helps raise the performance level of the other schools.


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One example of successfully grouping schools together takes place in Qibao, a suburb of Shanghai-China. The Qibao Education Group includes a strong secondary school that acts as the core and leads five other schools: three public schools that were adopted and two private schools established by the group. Qibao's secondary school, the core school, excels in science, arts and technology, among other domains, and is known for its effective leadership. All six schools, including Qibao's secondary school, have demonstrated continuous improvement since becoming a member (OECD, 2011c).

To learn more about how strong and weaker schools learn from each other in Shanghai-China, go to:

-  [*Strong Performers and Successful Reformers in Education: Shanghai, China – Raising standards by getting strong-performing schools to help weaker ones*](#)
- [*Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*](#)

Source: OECD (2011c), [*Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*](#), OECD Publishing, Paris.

Student performance at your school across reading proficiency levels

The mean performance estimate for your school in reading is based on the average of the students who were tested. It will therefore be revealing to look more closely at student performance in your school – beyond the mean score – in terms of different levels of performance reached by different groups of students. As discussed previously and described in Figure 2.4, it is useful to consider student performance in terms of PISA proficiency levels.

Students who reach proficiency Levels 5 and 6 are top performers even when compared with their peers around the world and can be considered as being well on their way to becoming the skilled knowledge workers of tomorrow.

Proficiency Level 2 is considered by PISA as a baseline level at which students begin to demonstrate the reading skills and competencies that will allow them to participate effectively and productively in life as they continue their studies, and as they enter into the labor force and become members of society. Students below this level, while not necessarily illiterate, do not show the basic proficiency that would be expected to ensure their success later in life.

Your school's results in terms of the distribution of student performance across proficiency levels are presented in Figure 5.5, which shows the percentage of 15-year-olds at your school who reached the six proficiency levels. The figure shows a dark vertical line at the 0% value of the x-axis such that the percentage of students at *Level 1 or below* is found on the left-hand side and the percentage of students at *Level 2 or above* is on the right-hand side.

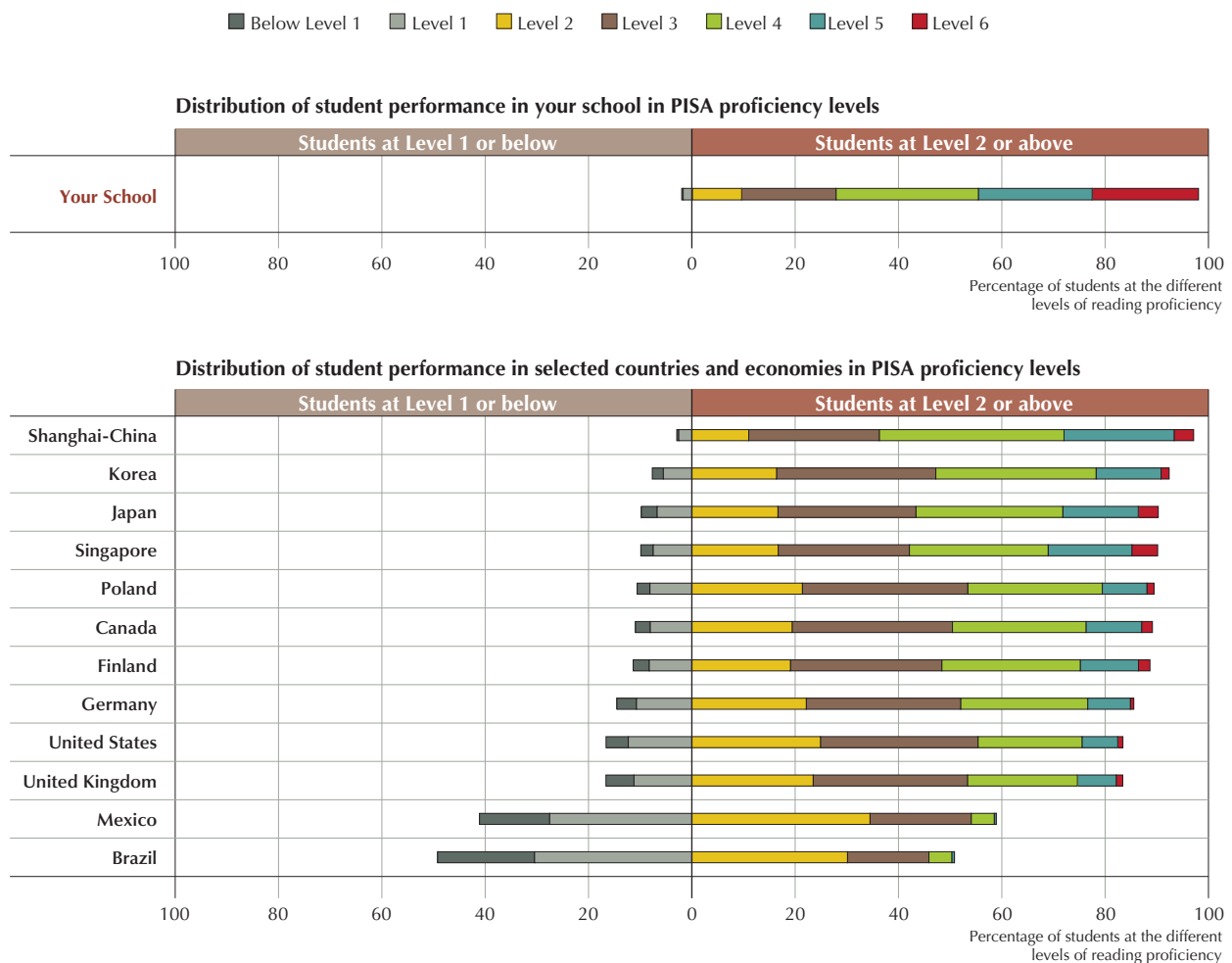
For reference, the lower part of the figure shows the distribution of student performance across reading proficiency levels in selected countries and economies that participated in PISA 2012. Countries and economies in this part of the figure are ranked in ascending order of the percentage of students below baseline proficiency Level 2. As with your school's results, the dark line at 0% separates the two sides of

the figure: the percentages of students at Level 2 and above are found on the right-hand side of the figure, while students at Level 1 and below are on the left of the dark line.

The distribution of student performance across proficiency levels for the comparison group of countries and economies in PISA 2012 is revealing. In Shanghai-China, nearly 25% of students – 1 out of 4 – perform at the highest levels (proficiency Levels 5 and 6), while in the United States only 8% reach these levels. Singapore, another high-performing economy in PISA 2012, has 5% of students performing at the very highest level (proficiency Level 6), whereas in the United States only 1% reach this level and in Mexico, the lowest-performing OECD country, virtually no students reach this level of performance.

The percentages of students reaching baseline proficiency Level 2 or above in reading are also revealing. While nearly all students in Shanghai-China reach this level (97%), only 1 out of 2 students does so in Brazil and 3 out of 5 students do so in Mexico.

Figure 5.5 ■ **How the distribution of student performance at your school compares with student performance in selected countries and economies in reading in PISA 2012**



Countries are ranked in ascending order of the percentage of students below Level 2.

Source: OECD (2013b), *PISA 2012 Results: What Students Know and Can Do: Student Performance in Mathematics, Reading and Science (Volume I)*, OECD Publishing, Paris. <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-I.pdf>



Box 5.4 **The importance of recruiting and training good teachers: Examples from Singapore**

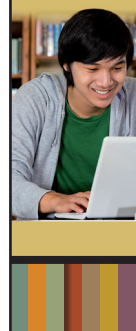
“Dream, Design, Deliver” is how the success story in Singapore has been described in a recent OECD report looking at examples from some of the world’s highest-performing and most equitable education systems (report and video series titles *Strong Performers and Successful Reformers in Education: Lessons from PISA*). In Singapore, educational reform has been a priority and it has served as a foundation for the city-state’s transformation from a developing country to a vibrant, modern economy in less than half a century. Prime Minister Goh Chok Tong (1990-2004) once said, “The wealth of a nation lies in its people,” and it is therefore not surprising that Singapore focuses so much on teacher training and strong school leadership (OECD, 2011c). Not only do values and civic education play a major role in schools, but teaching in Singapore is a highly regarded profession. PISA results show that schools in Singapore are effective in fostering the highest-achieving students. The following policies and practices implemented in Singapore reflect the importance placed on teacher training and school leadership.

- **The standards for selecting teachers are high.** Teachers are selected from the top one-third of each class by panels that include current school principals. Once accepted for training (training is centralized at one institution), prospective teachers receive full tuition as well as a monthly stipend that is competitive with the monthly salary of recent graduates in other fields. These competitive standards help establish teaching as a respected profession.
- **Teachers are appraised annually, as are other professions.** The contribution to the school and the academic and character development of their students matter in teachers’ evaluations, as do their collaboration with parents, community groups and colleagues. Even in primary schools, students are taught by more than one teacher, so it is not surprising that in Singaporean schools, teaching is looked at as a group effort.
- **Prospective career paths are introduced to teachers who are newer to the field.** After three years of teaching in schools, teachers are evaluated to determine what career path is most suited to their talent: master teacher, specialist in curriculum or research or school leader (OECD, 2011c).
- In addition, **teachers who show strong leadership skills are continuously assessed in order to ascertain potential vice-principals.** The potential candidates are given every opportunity to learn and to demonstrate their abilities. They can be asked to serve on committees or be promoted to head of the department. If they show promise as future school leaders, teachers are interviewed and go through leadership situational exercises. If they successfully pass these, teachers go on to six months of executive leadership training that includes a study trip abroad and a project on school innovation. Only 30 to 40 candidates are selected for the “Leaders in Education” course per year.

Teachers are continuously supported and encouraged to develop their skills within the profession. Every school has a fund through which it can support teacher growth, including developing fresh perspectives by going abroad to learn about aspects of education in other countries. Teacher networks and professional learning communities encourage peer-to-peer learning, and the Academy of Singapore Teachers opened in September 2010 to encourage teachers to share best practices.

Last but not least, teachers are entitled to 100 hours of professional development per year, mostly at no cost to them, in order to keep up with the rapid changes occurring in the world and to continuously improve their practice. They may attend courses that focus on curricular and pedagogical knowledge and that lead to higher degrees or advanced diplomas. Teachers may also opt to develop skills at

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school, mentored by staff developers. By focusing on one school, these staff developers can identify teaching-based problems such as a group's mathematics performance, or introduce new practices such as project-based learning.

The size of the Singapore education system in context


Singapore's success and its policies regarding the recruitment and training of teachers may be particularly relevant for local education systems with similar numbers of secondary schools and students. With 196,220 students enrolled in 155 secondary schools in 2010 (Ministry of Education, 2010), Singapore's education system is comparable in size to several state education systems in the United States, where the numbers of students enrolled in high schools – the secondary-school equivalent – are similar. For example, the state of Connecticut had a total of 173,071 students enrolled in 259 secondary schools in 2010; Oregon had 178,119 students in 307 secondary schools; and Kentucky had 192,661 students in 478 secondary schools (U.S. Department of Education, 2010).

Of the more than 14,000 school districts in the United States (U.S. Census Bureau, 2012), several are similar in size to the education system in Singapore in terms of the number of secondary schools and students enrolled. Districts that are roughly of similar size include the Chicago Public Schools, the third-largest school district after New York City Public Schools and the Los Angeles Unified School District, with 113,873 students enrolled in 106 high schools (CPS, 2012).

Additionally, the average student/teacher ratio in secondary schools in Singapore is higher than in the United States: during the 2007-2008 school year, the average secondary student/teacher ratio in the United States was nearly 12:1 (U.S. Department of Education, 2008), while the ratio in Singapore was 16:1 (Ministry of Education, 2010).

Thus, the example from Singapore may offer relevant insights for local education systems such as in the United States and the United Kingdom (e.g., with districts and local authorities) that wish to focus on the quality and effectiveness of teacher recruitment and training policies.

To find out more about Singapore's approach to recruiting and keeping good teachers in schools, go to:

-  [*Strong performers and successful reformers in Education: Building a strong and effective teaching force*](#)
- [*Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*](#)
- [*Evaluating and Rewarding the Quality of Teachers: International Practices*](#)

Sources: [CPS \(2012\), Chicago Public Schools](#).

Ministry of Education (2010), [Report of the Secondary Education Review and Implementation \(SERI\) Committee](#), Ministry of Education, Singapore.

OECD (2009b), [Evaluating and Rewarding the Quality of Teachers: International Practices](#), OECD Publishing, Paris.

OECD (2011c), [Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education](#), OECD Publishing, Paris.

U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), ["State Nonfiscal Public Elementary/Secondary Education Survey,"](#) 2010-11, Version 1a.

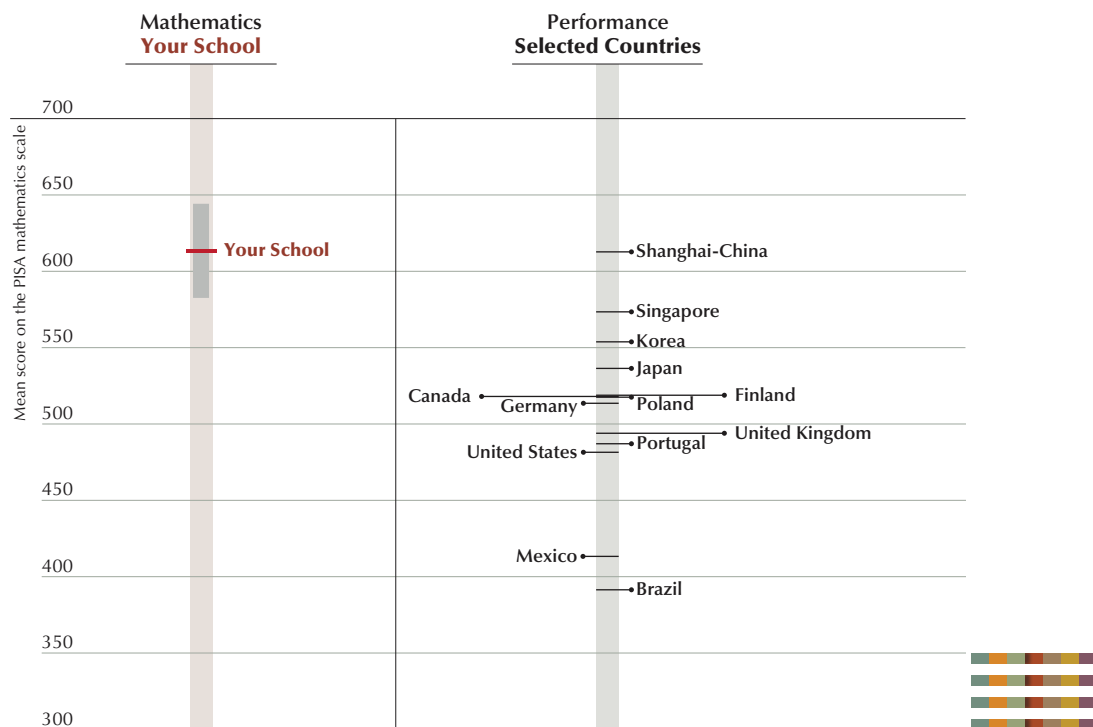
U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), ["State Nonfiscal Survey of Public Elementary/Secondary Education,"](#) 2007-08, Version 1b.

[United States Census Bureau \(2012\), School Districts](#).

YOUR SCHOOL'S PERFORMANCE IN MATHEMATICS IN AN INTERNATIONAL CONTEXT

Figure 5.6 shows your school's mean performance results in mathematics on the PISA scales (score points on the vertical axis on the left-hand side of the figure) with the 95% confidence interval around your school's mean score. On the right-hand side of the figure, the average results in mathematics in PISA 2012 for the group of 12 comparison countries and economies described previously are also presented.

Figure 5.6 ■ How students at your school compare with students from selected countries and economies in mathematics in PISA 2012

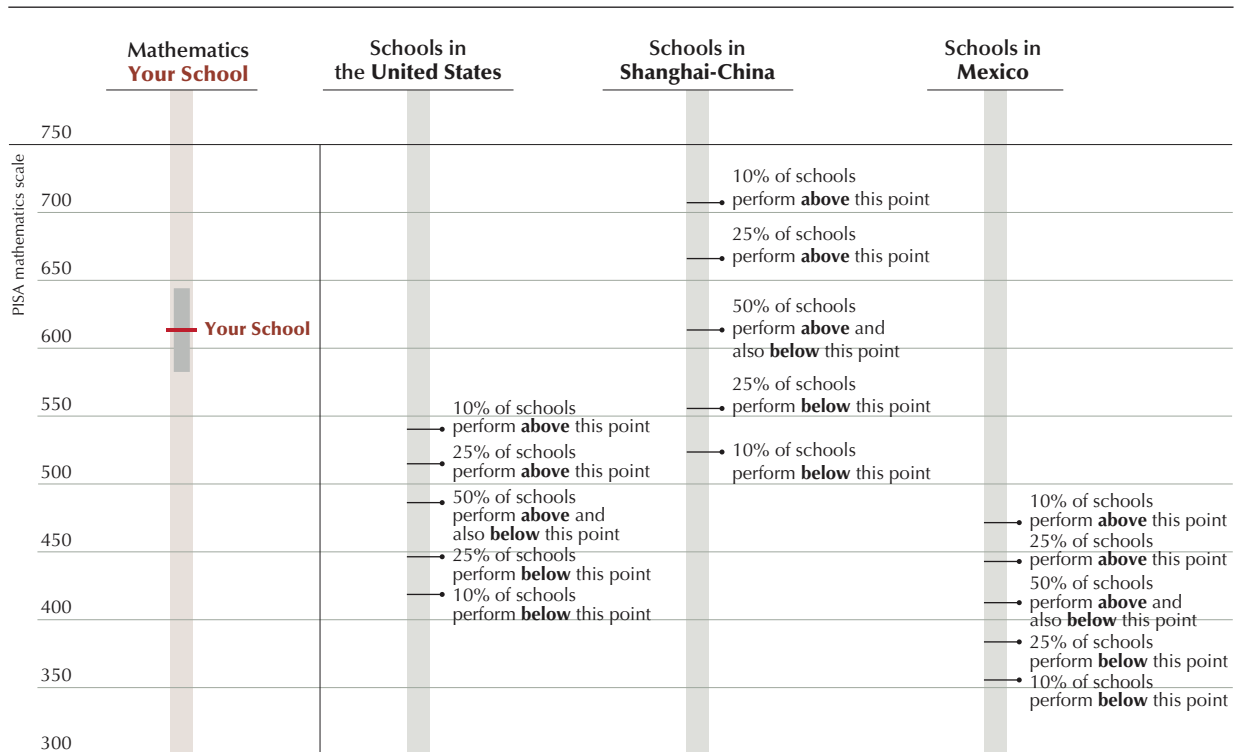


Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance scores would fall within this confidence interval. Source: OECD.

To make meaningful comparisons of your school's mean performance in mathematics, it is useful to compare your results with those of groups of schools internationally. In Figure 5.7, your school's mean performance estimate is presented on the PISA mathematics scale along with the 95% confidence interval. The performance of other schools in the United States, Shanghai-China and Mexico that participated in PISA 2012 are presented on the right side of your school's results.

Performance scales for other schools in the United States, Shanghai-China and Mexico that participated in PISA 2012 are presented alongside your school's results. As with earlier similar figures, the markers on the scales show the cut-off score *above* which 10% of students perform for the particular country or economy. The second marker from the top shows the score *above* which 25% of students in schools perform for the country or economy. The middle marker shows the middle point at which 50% of schools perform *above* and *below*. The bottom two markers for each country and economy show the points *below* which schools that account for 25% and 10% of students perform.

Figure 5.7 ■ How your school compares with schools in other countries and economies in mathematics in PISA 2012



Notes: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance score would fall within this confidence interval. Schools are weighted by the number of students enrolled. For example, the legend “10% of schools perform **above** this point” refers to the highest-performing schools that account for 10% of the total number of students in the country.

Source: OECD.

This figure allows you to compare your school’s results in mathematics with those of groups of schools in your country and with those of different groups of schools in the highest and lowest performers in PISA 2012. Given the large differences in student performance between Shanghai-China and Mexico, your school’s mean performance estimates will correspond to very different percentiles within these economies.

Continuing with the same idea of comparing your school’s performance with that of schools in other countries and economies, Figures 5.8 and 5.9 show your school’s performance results in mathematics in the context of the highest-performing economy – Shanghai-China – and of the lowest-performing OECD country – Mexico – in PISA 2012.

Because performance should be considered in terms of the factors that might hinder or enhance student achievement, the average socioeconomic status of students at these schools is also shown in the figures to allow for meaningful comparisons.

As with the previous bubble charts, performance on the PISA mathematics scale increases from bottom to top (on the y-axis) and students’ socioeconomic advantage increases from left to right (on the x-axis). As before, the x-axis shows the average index values of the PISA index of economic, social and cultural status (ESCS) from -3.0 (very disadvantaged) to +3.0 (socioeconomically advantaged). The scale used is calibrated so that the OECD average is 0.0 and plus or minus 1 is equivalent to 1 standard deviation from the OECD average.

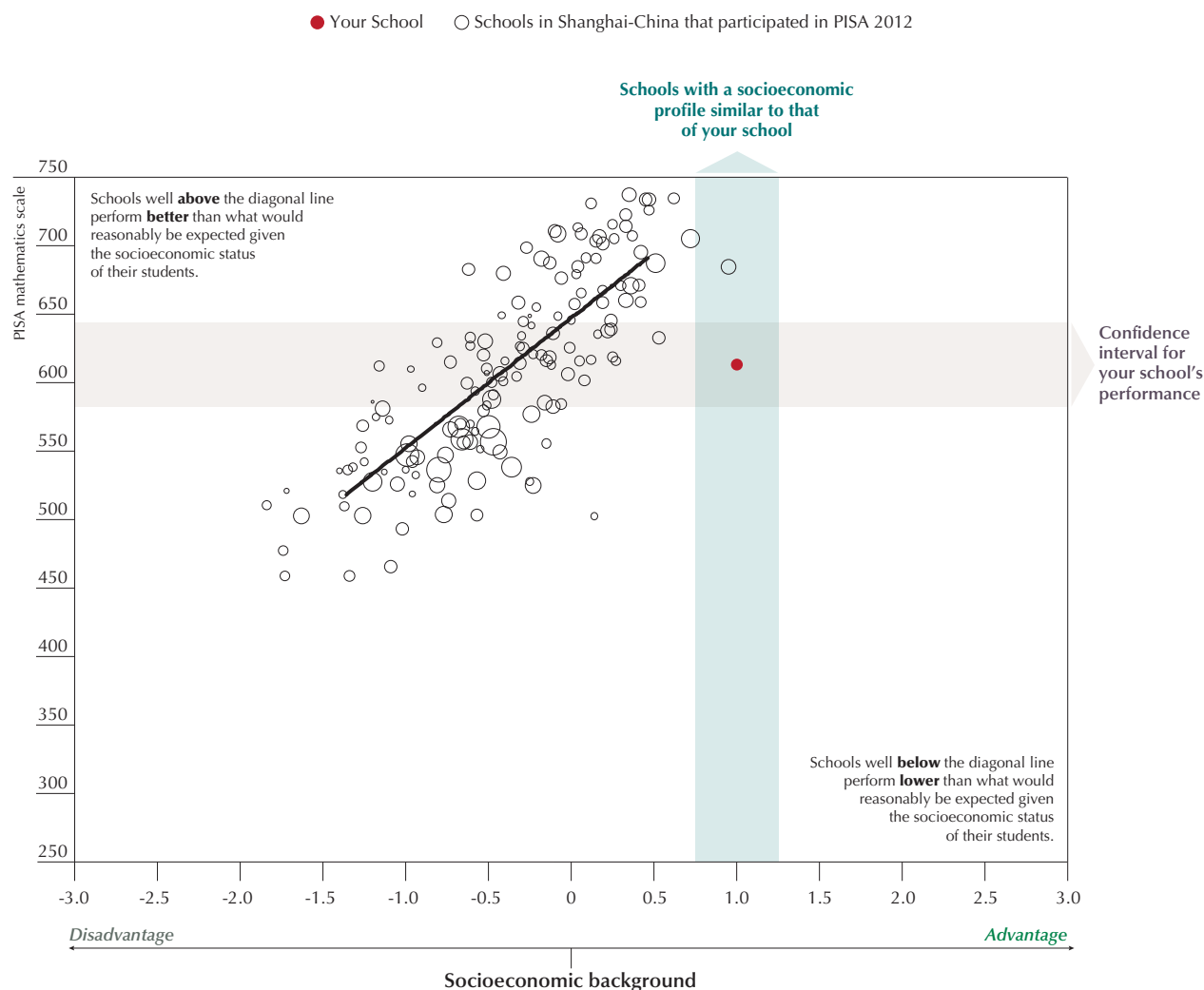


Schools with similar socioeconomic backgrounds to your school are indicated by the vertical *light-blue* band. The confidence interval for your school's results is indicated by the horizontal *gray* band. The size of the bubbles indicates the number of students enrolled at each school.

A diagonal trend line is also shown to help the reader understand school performance in Shanghai-China and Mexico in relation to students' average socioeconomic background. Schools above the diagonal line perform better than what would reasonably be expected given their students' socioeconomic status. Schools below the line perform lower than what would reasonably be expected given their students' socioeconomic status.

The following points may be helpful in considering your school's relative performance in the context of two very differently performing education systems, such as Shanghai-China's and Mexico's. The position of your school's results in terms of mathematics performance (y-axis) and the socioeconomic status of students (x-axis) does not change. What changes is the comparison group of schools in Shanghai-China and in Mexico.

Figure 5.8 ■ **How your school's results in mathematics compare with schools in Shanghai-China in PISA 2012**



Note: Size of bubbles is proportional to the number of students enrolled at the school. One school is not shown on the graph because its results are outside of the axis range.
Source: OECD.

Figure 5.9 ■ **How your school's results in mathematics compare with schools in Mexico in PISA 2012**



Note: Size of bubbles is proportional to the number of students enrolled at the school. Nineteen schools are not shown on the graph because their results are outside of the axis range.

Source: OECD.

First, it is important to look at the group of schools that fall within the blue band that indicates these schools serve students who have similar socioeconomic status, as measured by the PISA index. Are there many schools above or below your school along the blue band? Next, it is also revealing to look at the gray band – horizontally – to identify the schools that have a similar average performance as your school. Are there many schools with similar performance results as your school, and are they serving students from more or less advantaged socioeconomic backgrounds?

Student performance at your school across mathematics proficiency levels

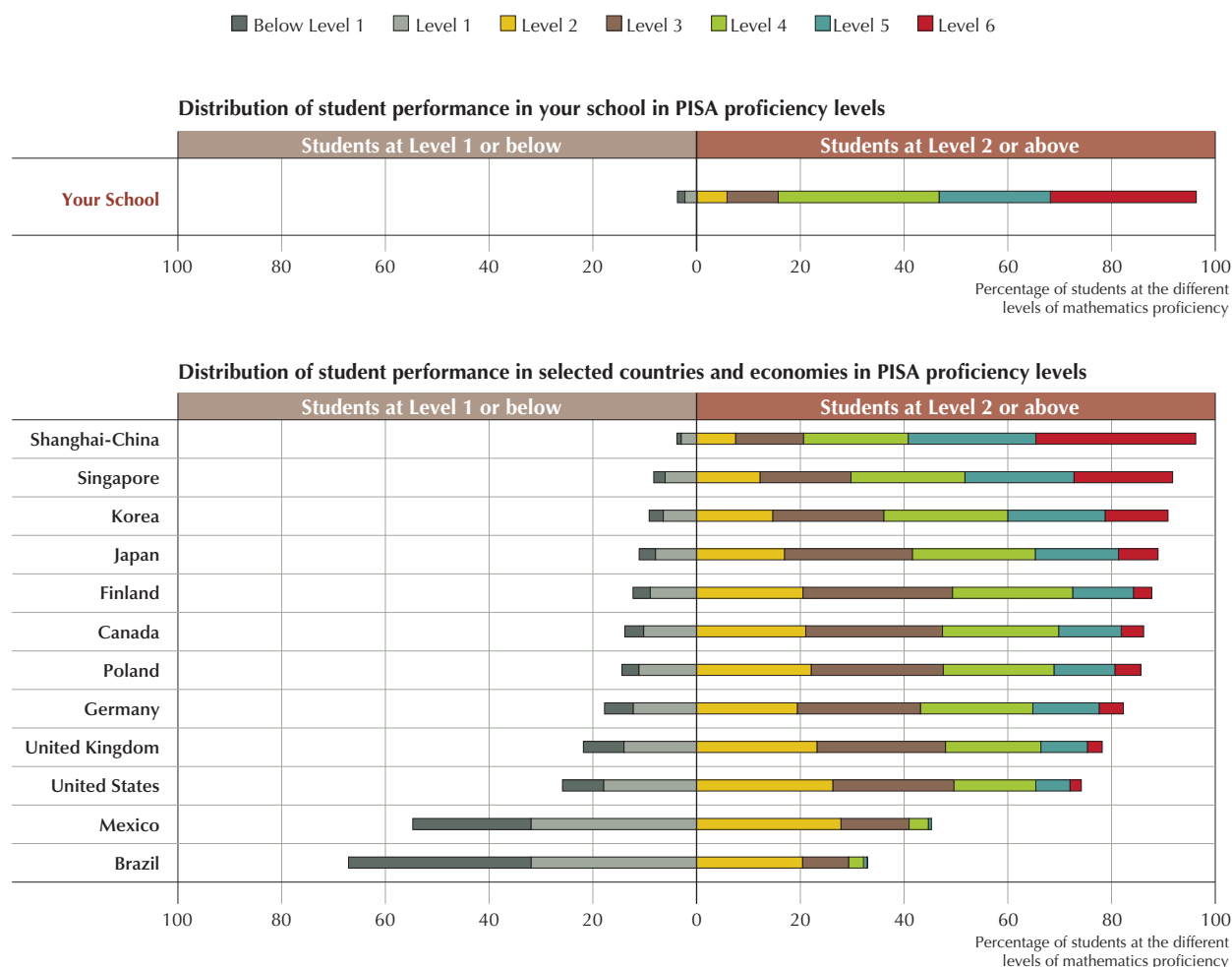
The mean performance estimate for your school in mathematics is based on the average of the students who were tested. It will therefore be revealing to look at the different levels of performance in mathematics reached by different groups of students. As discussed previously and described in Figure 2.7, it is useful to consider student performance in terms of mathematics proficiency levels in PISA.



- Students who reach proficiency Levels 5 and 6 are top performers even when compared with their peers around the world and can conceptualize, generalize and utilize information based on their investigations and modeling of complex problems. Students at these levels can also develop and work with models for complex situations, identifying constraints and specifying assumptions. They can reflect on their actions and communicate their interpretations and reasoning.
- Proficiency Level 2 is considered by PISA as a baseline level of mathematics proficiency at which students begin to demonstrate the kind of skills that enable them to use mathematics in ways considered fundamental for their future development. Students below this level are likely to find the basic mathematical tasks that the assessment measures as challenging or too difficult.

Your school's results in terms of the distribution of student performance across proficiency levels in mathematics are presented in Figure 5.10, which shows the percentage of 15-year-olds at your school who reached the six proficiency levels. The figure shows a dark vertical line at the 0% value of the x-axis such that the percentage of students at *Level 1 or below* is found on the left-hand side of the figure and the percentage of those at *Level 2 or above* is found on the right-hand side.

Figure 5.10 ▪ **How the distribution of student performance at your school compares with student performance in selected countries and economies in mathematics in PISA 2012**



Countries are ranked in ascending order of the percentage of students below Level 2.

Source: OECD (2013b), *PISA 2012 Results: What Students Know and Can Do: Student Performance in Mathematics, Reading and Science (Volume I)*, OECD Publishing, Paris. <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-I.pdf>

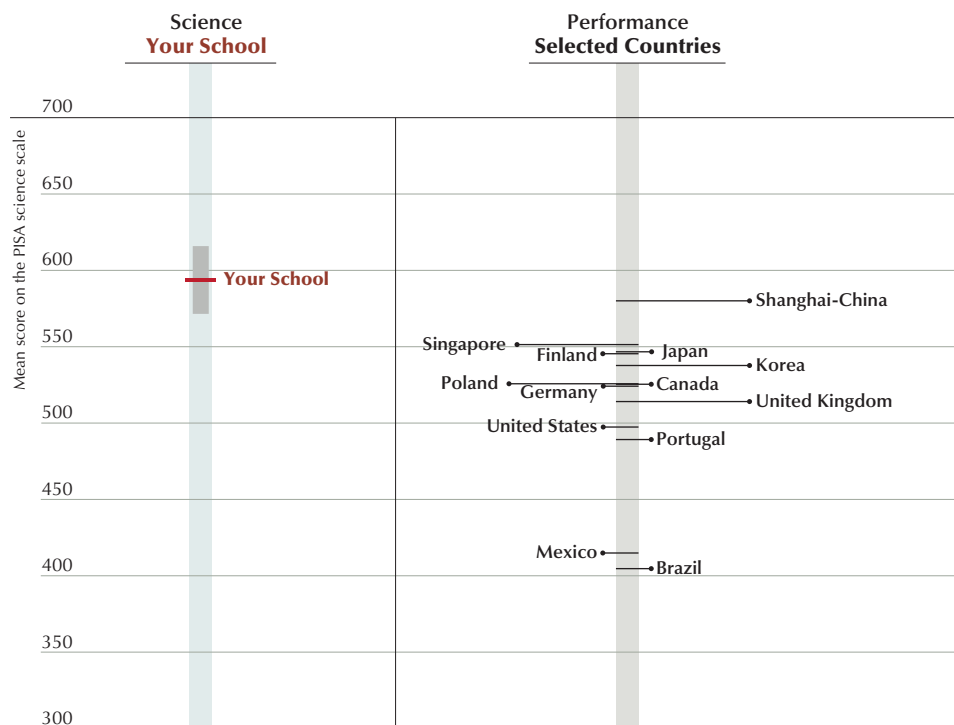
The lower part of the figure shows the distribution of student performance across mathematics proficiency levels in selected countries and economies that participated in PISA 2012. Countries and economies in this part of the figure are ranked in ascending order of the percentage of students below baseline proficiency Level 2. As with your school's results, the dark line at 0% separates the two sides of the figure: the percentages of students at mathematics proficiency Level 2 and above are found on the right-hand side of the figure, while those at Level 1 and below are on the left.



YOUR SCHOOL'S PERFORMANCE IN SCIENCE IN AN INTERNATIONAL CONTEXT

Figure 5.11 shows your school's performance results on the PISA science scale (along the vertical axis on the left-hand side of the figure) with the 95% confidence interval around your school's mean score. The right-hand side of the figure shows the average results in science in PISA 2012 for the group of comparison countries and economies.

Figure 5.11 ■ How students at your school compare with students from selected countries and economies in science in PISA 2012



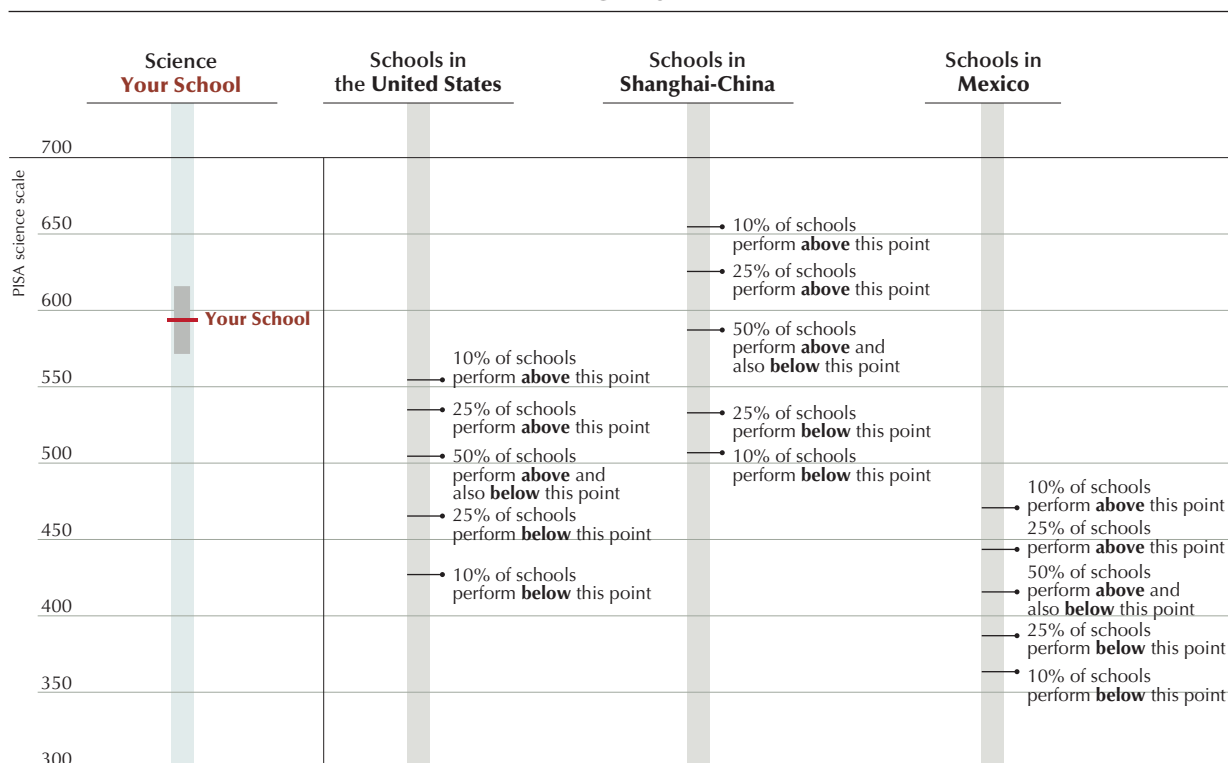
Note: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance scores would fall within this confidence interval. Source: OECD.

To allow you to compare your school's mean performance in science with that of other schools internationally, Figure 5.12 presents your school's mean performance estimate on the PISA science scale along with the 95% confidence interval. This figure allows you to compare your school's results in science with that of groups of schools in your country and also with different groups of schools in the highest and lowest performers in PISA 2012.



Performance scales in science for schools in the United States, Shanghai-China and Mexico that participated in PISA 2012 are presented alongside your school's results. As with earlier similar figures, the markers on the scales show the cut-off score *above* which 10% of students perform for the particular country or economy. The second marker from the top shows the score *above* which 25% of students in schools perform for the country or economy in science. The middle marker shows the middle point at which 50% of schools perform *above* and *below*. The bottom two markers for each country and economy show the points *below* which schools that account for 25% and 10% of students perform in science. Given the large differences in student performance between Shanghai-China and Mexico, your school's mean performance estimates will correspond to very different percentiles within these economies and so you can see where the performance of your students compares – on average – with that of students and schools in these education systems.

Figure 5.12 ■ How your school compares with schools in other countries and economies in science in PISA 2012



Notes: Shaded bars above and below the mean scores represent the 95% confidence interval. In other words, in the case of the results for your school, we are 95% confident that if your school were to administer the test several times, your mean performance score would fall within this confidence interval. Schools are weighted by the number of students enrolled. For example, the legend "10% of schools perform **above** this point" refers to the highest-performing schools that account for 10% of the total number of students in the country. Source: OECD.

Figures 5.13 and 5.14 show your school's performance results in science in the context of the schools that participated in PISA 2012 in Shanghai-China and in Mexico. In addition to mean performance in science, students' average socioeconomic status at these schools is also shown in the figures to allow for meaningful comparisons with your school's results.

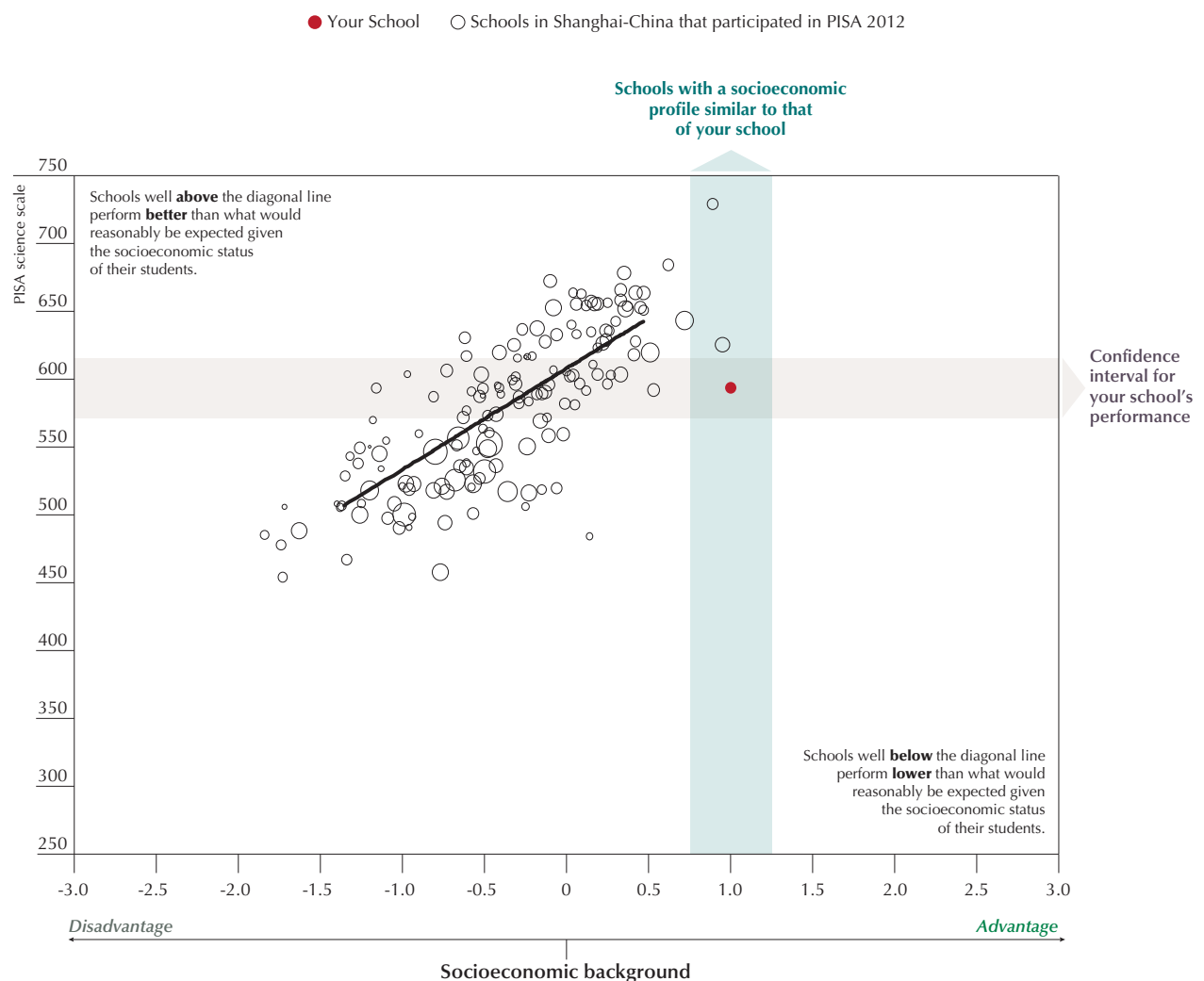
As with the previous bubble charts, performance on the PISA science scale increases from bottom to top (on the y-axis) and students' socioeconomic advantage increases from left to right (on the x-axis).

As before, the x-axis shows the average index values of the PISA index of economic, social and cultural status (ESCS) from -3.0 (very disadvantaged) to +3.0 (socioeconomically advantaged).

Figure 5.13 shows your school's performance in science relative to the schools that participated in Shanghai-China. The figure shows that most of the students and schools in Shanghai-China have a lower socioeconomic status than the OECD average (0.0 on the charts), including the United States (0.17), the United Kingdom (0.27) and Canada (0.41). It is important for you to consider your school's relative position not only vertically (i.e., on the performance scale) but also in terms of socioeconomic status vis-à-vis other schools in Shanghai-China.

This figure also shows that while the average performance in science for Shanghai-China was 580 score points, students in many schools actually show results well above 600 points and some even above 650 points.

Figure 5.13 ■ **How your school's results in science compare with schools in Shanghai-China in PISA 2012**



Note: Size of bubbles is proportional to the number of students enrolled at the school.
Source: OECD.

Figure 5.14 ■ How your school's results in science compare with schools in Mexico in PISA 2012



Note: Size of bubbles is proportional to the number of students enrolled at the school. Nineteen schools are not shown on the graph because their results are outside of the axis range.

Source: OECD.

Schools with similar socioeconomic backgrounds to yours are indicated by the vertical *light-blue* band. The confidence interval for your school's results is indicated by the horizontal *gray* band. The size of the bubbles indicates the number of students enrolled at each school.

A diagonal trend line is also shown to help the reader understand school performance in relation to socioeconomic backgrounds. Schools above the diagonal line perform better than what would reasonably be expected given their students' socioeconomic status. Schools below the line perform lower than what would reasonably be expected given their students' socioeconomic status.

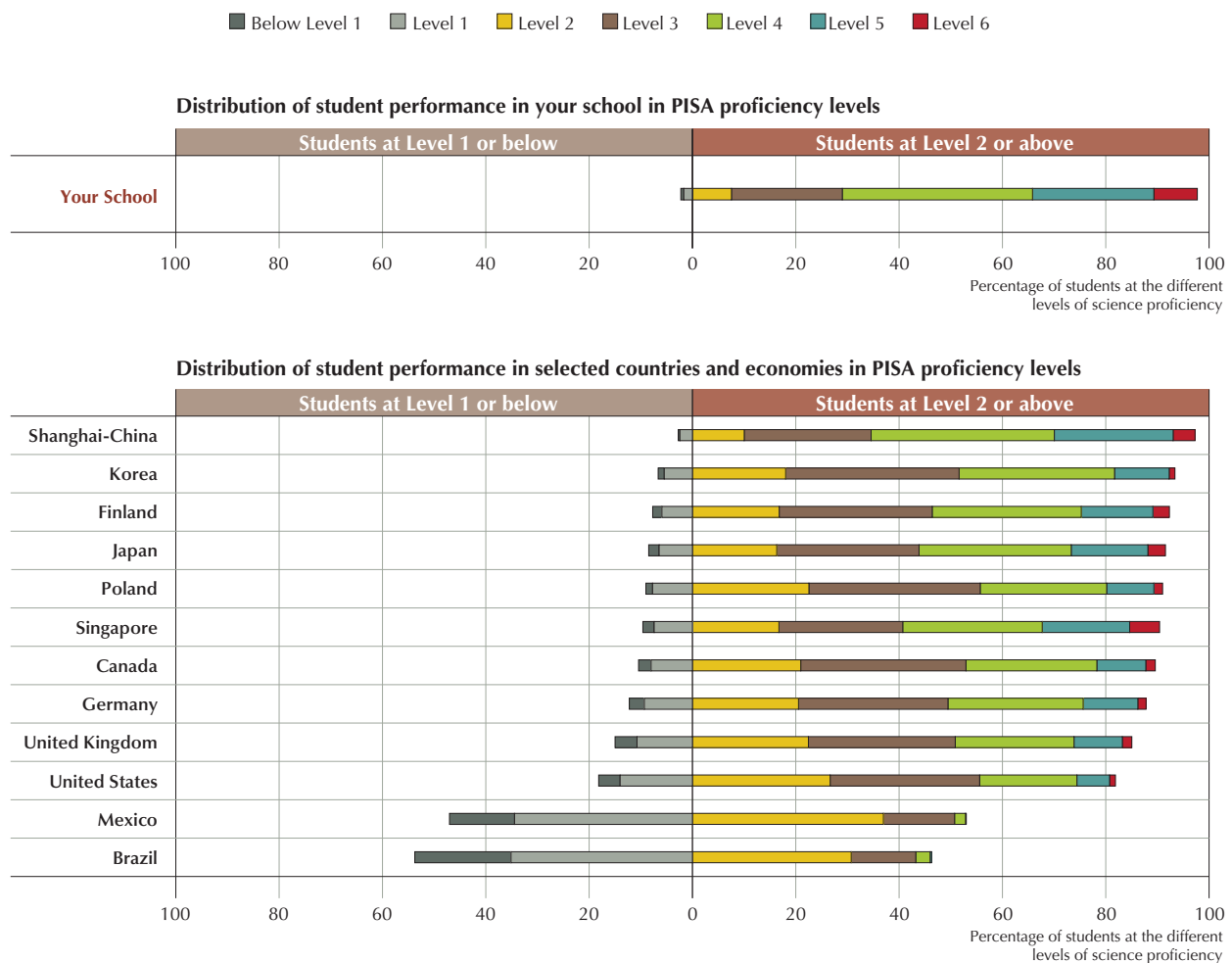
When considering your school's relative performance in science in the context of two very different-performing education systems such as Shanghai-China's and Mexico's, it is important to remember that the position of your school's results in terms of science performance (y-axis) and students' socioeconomic status (x-axis) does not change between Figures 5.13 and 5.14. What changes is the relative position of your school in relation to those in either country based on their students' performance and socioeconomic status.

When looking at the group of schools that fall within the blue band that indicates schools that serve students who have similar socioeconomic status as measured by the PISA index, it is useful for you to identify whether there are many or few schools above and below your school along the blue band. Similarly, it is useful to look at the horizontal gray band to identify the schools that have a similar average performance as your school. Are there many or few schools that have similar performance results in science as your school, and are they serving students from more or less advantaged socioeconomic backgrounds? How does your school compare once you look at your relative position in these charts?

Student performance at your school across science proficiency levels

The performance estimates for your school in reading, mathematics and science are based on the average of the students who were tested. To go beyond these performance means, it is useful to look at the different levels of performance in science reached by different groups of students at your school. As described in Figure 2.10, *The six levels of science proficiency in PISA*, it is useful to consider the types of tasks that students can do at different proficiency levels of performance.

Figure 5.15 ■ How the distribution of student performance at your school compares with student performance in selected countries and economies in science in PISA 2012



Countries are ranked in ascending order of the percentage of students below Level 2.

Source: OECD (2013b), *PISA 2012 Results: What Students Know and Can Do: Student Performance in Mathematics, Reading and Science (Volume I)*, OECD Publishing, Paris. <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-I.pdf>



Students who reach proficiency Levels 5 and 6 are top performers even when compared with their peers around the world, and these students can consistently identify, explain and apply scientific knowledge in a variety of complex life situations. These students clearly and consistently demonstrate advanced scientific thinking and reasoning, and they show a willingness to use their understanding in support of solutions to unfamiliar scientific and technological situations. Students at this level can also use well-developed inquiry abilities, link knowledge appropriately and bring critical insights to situations. They can also construct explanations based on evidence and arguments based on their critical analysis.

Proficiency Level 2 is considered by PISA as a baseline level at which students begin to demonstrate the science competencies that will enable them to participate actively in life situations related to science and technology. Although students below this level might be able to present scientific explanations that are obvious and that follow explicitly from the given evidence, they do not demonstrate the baseline proficiency in science that would enable them to be successful in science-related endeavors.

Your school's results in terms of the distribution of student performance across proficiency levels in science are presented in Figure 5.15, which shows the percentage of 15-year-olds at your school who reached the six proficiency levels. The figure shows a dark vertical line at the 0% value of the x-axis such that the percentage of students at *Level 1 or below* is found on the left-hand side and the percentage of students at *Level 2 or above* is on the right-hand side.

The lower part of the figure shows the distribution of student performance across science proficiency levels in selected countries and economies that participated in PISA 2012. Countries and economies in this part of the figure are ranked in ascending order of the percentage of students below baseline proficiency Level 2 in science. As with your school's results, the dark line at 0% separates the two sides of the figure: the percentages of students at science proficiency Level 2 and above are found on the right-hand side of the figure, while those at Level 1 and below are on the left.

When looking at this figure, it might be useful for you to consider whether your school seems particularly effective in stimulating students to achieve at world-class levels (Levels 5 and 6) at the same time that it ensures that no students are falling behind and performing below proficiency Level 2. Similarly, a school may show results that indicate a solid distribution of students at Levels 2, 3 and 4, while not showing students who achieve at the highest levels internationally.

Box 5.5 **Teacher-to-teacher peer learning in Japan and Shanghai-China**

For teachers in East Asian education systems, the tradition of lesson study, where teachers review lesson plans in group settings, means that they are not alone. Teachers are expected to work together in a disciplined way to improve the quality of the lessons they teach. East Asian school systems realize that by learning from each other, teachers not only learn different methods that are effective in the classroom, but they are also more at ease with and willing to modify their approaches in order to optimize learning (OECD, 2012f). As part of the preparation for the second International Summit on the Teaching Profession in March 2012, the OECD produced a background report, *Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World*, highlighting several examples from East Asian school systems that appear to have positive results on effective teaching and learning strategies.

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Illustrating best practice in Japan and Shanghai-China

In Japan, when a new subject is added to the national curriculum, groups of teachers and researchers review research and curriculum materials and refine their ideas in pilot classrooms for over a year before holding a public research lesson, which can be viewed electronically by hundreds of teachers, researchers and policy makers. By working to improve the quality of the lessons, teachers whose practice lags behind that of the leaders can see what good practice entails and, because their colleagues know who the poor performers are and engage them in discussions, the poor performers have both the incentive and the means to improve.

Schools in Shanghai-China provide another example of how teachers effectively discuss best practices in a group setting. During the course of their careers, teachers in Shanghai are involved in subject-based “teaching-study groups” to improve teaching on a day-to-day basis. There are carefully planned sessions when the study group meets to draw up very detailed lesson schemes for a particular topic for the following week. The lesson plan serves not only as a guide for the teacher during the lesson, but also as documentation of the teachers’ professional performance. During actual teaching, teachers may observe each other or may be observed by peers, particularly when a change in curriculum introduces a new topic; teachers may also be observed by new teachers, so they may learn from more experienced colleagues for mentoring purposes, or by the school principal for monitoring or for constructive development assistance. Sometimes, teachers are expected to teach demonstration lessons, called public lessons, for a large number of other teachers to observe and comment upon.

To learn more about how schools can foster teacher-to-teacher peer learning, go to:

- [*Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World*](#)
- [!\[\]\(e492b5d52ab457a7a3c2826c4091dfee_img.jpg\) *Strong Performers and Successful Reformers in Education: Shanghai, China – Raising standards by getting strong-performing schools to help weaker ones*](#)

Source: OECD (2012f), [*Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World*](#), OECD Publishing, Paris.





ADDITIONAL EXAMPLES FROM AROUND THE WORLD



Box 5.6 **Fostering the potential of immigrant students and English-language learners in schools**

The best way to measure how well immigrants are integrated into a society is to look carefully at how their children adjust to and assimilate into their environment. Previous PISA cycles show that children of immigrant parents who have the same educational attainment, or similar socioeconomic backgrounds as non-immigrant parents, perform almost as well as or sometimes even better than non-immigrant children even after accounting for factors such as language barriers (OECD, 2012g). In a number of countries, however, many immigrant parents have lower educational attainment than non-immigrant parents and are often employed in low-skilled occupations. Thus, policy makers and schools must address the social and educational difficulties of immigrant children who come from disadvantaged socioeconomic backgrounds.

Results from previous PISA cycles show that certain approaches taken by policy makers and educators might have an enormous impact on the learning outcomes of immigrant children from disadvantaged backgrounds. A recent publication by the OECD, *Untapped Skills: Realising the Potential of Immigrant Students* (OECD, 2012g), delves into the effective policies that educators and policy makers have considered to help close the gap between immigrant and non-immigrant students.

- ***Facilitating the transition for disadvantaged immigrant students to a new language and a new learning environment is a critical challenge.*** Students who arrive later in age in a host country might have more difficulty learning a new language and adjusting to a new learning environment with different curricula and educational standards. Policies that favor earlier arrival of immigrant children whenever possible might help these children adjust more easily to a new education system. In addition, immigrant children who arrive young in a host country benefit significantly from attending pre-primary school, as they can more easily adapt to a new language and a different curriculum at a younger age. On average in the OECD, a second-generation student who has attended pre-primary education has a reading score 23 points higher than one who did not (OECD, 2012g).

PISA results also show that students who speak their language of origin outside of school perform on average 30 score points lower in reading than non-immigrant children. Schools and teachers who convey the importance to parents of exposing their children at home to reading material in the host country's language will produce better reading outcomes even after taking into account parental education and language.

- ***Schools and educators should seek actively to support their students' increased exposure to the host-country language, both within and out of school.*** English-language learning strategies need to be reinforced both for very young immigrant children and for students who arrive later with little knowledge of the host-country language. Continuous language support throughout all levels of education is particularly helpful to ensure successful transitions from one level of education to another. While students generally acquire communicative language skills relatively quickly, developing the distinct academic language used in school environments takes significantly longer (OECD, 2010a).

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In addition, the language skills of parents might be insufficient to allow them to help their children with their schoolwork. This is particularly relevant in the age of the Internet, when media in the language of the country of origin are more easily accessible in immigrant households than ever before. Parents should be made aware of this and be invited to participate so that the home environment contributes to higher exposure to the host-country language and to improving student learning outcomes.

- ***Schools should also look at diversity as a resource for rather than an obstacle to successful teaching and learning.*** School leaders and teachers often do not feel qualified and sufficiently supported to teach students with multi-cultural, bilingual and diverse learning needs. In order to close the achievement gap, institutional changes must be made at the school level, including changes in language teaching, school leadership, teaching methodologies and school-home co-operation. Not only is more exposure to the host country's language of value, but improving written and oral communication in immigrant students' mother tongue is also essential to developing a positive and appreciative approach to diversity and identity. This involves seeing students' language capacities as part of their social and cultural identity and welcoming these as a tool for learning and understanding (OECD, 2010a).

With a whole-school approach, support for immigrant students should be provided not only in specialized courses but also in an integrated way across the curriculum and throughout all school activities. Schools should develop new ways of communicating and collaborating, such as offering immigrants' languages as an option within the curriculum as well as language classes geared toward parents so as to better engage them in their children's progress.

- ***The concentration of students in disadvantaged schools in certain geographic areas has a powerful effect on reading outcomes, for both immigrant and non-immigrant students.*** Arriving immigrants might not always have the opportunity to choose their housing freely, because of housing costs, lower salaries or limited borrowing capacity. School composition greatly reflects these disadvantaged areas, as 47% of 15-year-olds on average across OECD countries are in schools where the principal reported that residence in a particular area was either a prerequisite or high priority for admittance (OECD, 2010a). PISA results also show that attending disadvantaged schools can have more negative effects for children of immigrants than for children of non-immigrants since lower proficiency in the language of the host country may compound the disadvantage "penalty" and not all immigrant students start speaking the host-country language at an early age, nor is the host-country language necessarily spoken in the home. On average in disadvantaged schools across OECD countries, immigrant students score 10 points lower than native students in reading literacy (OECD, 2012g).

How can the quality of teaching and learning be improved in schools with high concentrations of immigrants? By providing additional resources such as additional teaching staff, afterschool support and bilingual education offers, policy makers and educators will help ease the negative impacts of a high concentration of immigrant students in disadvantaged schools. In addition, working closely with parents from immigrant backgrounds, schools and teachers will help parents feel not only more implicated in their children's education but also more involved in their community.

Last but not least, another area that policy makers can look into involves implementing incentives that would incite schools to co-operate and/or take steps to more evenly balance the distribution of immigrant students.

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Knowing your options in North Carolina, United States

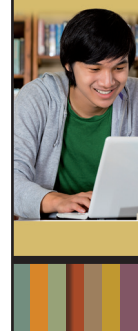
Districts in North Carolina provide a good example of encouraging immigrant parents to learn about different schools in their area. One school district ran school choice campaigns to encourage immigrant parents to exercise school choice. Features of the campaign included a district-wide information fair, school choice information stands in shopping areas and information hotlines in English, Spanish and Vietnamese. In another school district, officials used paid advertisements, outreach to news media and face-to-face communication to get out their message about public school choice options (OECD, 2010a).

To find out more about how immigrant students and language learners can reach their full potential, go to:

- [*PISA in Focus 11: How are school systems adapting to increasing numbers of immigrant students?*](#)
- [*PISA in Focus 22: How do immigrant students fare in disadvantaged schools?*](#)
- [*Untapped Skills: Realising the Potential of Immigrant Students*](#)

Sources: OECD (2010a), [*Closing the Gap for Immigrant Students: Policies, Practice and Performance*](#), OECD Publishing, Paris.
 OECD (2012g), [*Untapped Skills: Realising the Potential of Immigrant Students*](#), OECD Publishing, Paris.





Box 5.7 **A commitment to inclusion: An example from schools in Finland**


Every year hundreds of educators and policy makers travel to Helsinki, Finland, in order to learn, firsthand, the “secret” of Finland’s success in education. Not only have Finnish secondary students achieved high performance scores in PISA across the board since 2000, but the gap between the highest- and lowest-performing students within schools is small, and there is little variation among schools or among pupils of differing family backgrounds (OECD, 2010f). Although it is clear that one educational system cannot simply be replicated in another country with very different contexts, the success of schools in Finland in attempting to include all students in a trajectory of success can provide relevant insights to schools and local educators in other countries.

First, schools are at the heart of communities in Finland. They provide a daily hot meal for every student, plus health and dental care and psychological counseling, among other services, for students and their families. Everyone is involved in the success of students. Principals undertake their share of the teaching load, and teachers not only assess their students on an ongoing basis but also focus on helping students take on more responsibility for their own learning. Students are expected to work in teams on projects, cutting across traditional subject or disciplinary lines (OECD, 2011c).

Educators’ commitment to the inclusion of all students, especially those who may need extra help, can be considered one of the key factors behind the success of Finnish schools. Every school has a “special teacher,” a specially trained teacher whose job is to work closely with class teachers to identify students in need of extra help and to work individually or in small groups with these students to provide the support they need to keep up with their classmates.

Every comprehensive school also has a “pupils’ multi-professional care group” that meets at least twice a month for two hours (OECD, 2011c). The group consists of the principal, the special teacher, the school nurse, the school psychologist, a social worker and the teachers whose students are being discussed. During these meetings the teachers can raise any concerns they might have in their classes, whether they be about the learning environment or individual students. By discussing these issues, the group identifies students who might need help beyond what the school can provide. They then ensure that the family receives the proper care for their child, whether it be medical, social or psychological. In this way the school principal and the staff are not only aware of every student at their school, but are also implicated in their success along with the parents.

To find out more about how schools in Finland attempt to include all students in a trajectory of success, go to:

-  [*Strong Performers and Successful Reformers in Education: Maintaining a strongly supportive school system in which teachers and students share responsibility for results*](#)
- [*Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*](#)

Sources: OECD (2010f), [*PISA 2009 Results: What Students Know and Can Do: Student Performance in Reading, Mathematics and Science \(Volume I\)*](#), OECD Publishing, Paris.

OECD (2011c), [*Lessons from PISA for the United States, Strong Performers and Successful Reformers in Education*](#), OECD Publishing, Paris.



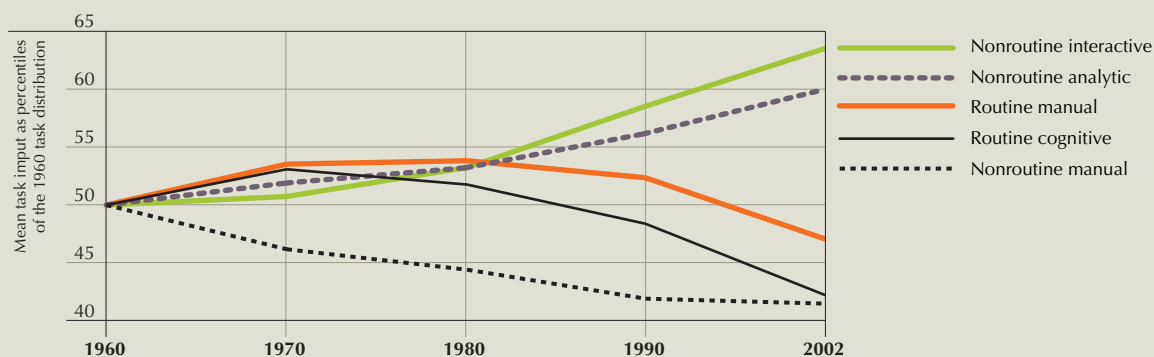
Box 5.8 **Learning – and teaching – in the 21st century: Implications for educators**

What is different today?

Across many education systems, there is increasing awareness of the need to allow students to acquire the knowledge and develop the skills and competencies they will need as adult citizens in globally competitive knowledge-based economies. Innovation in curricular content has not kept pace with other dramatic changes in many education systems. Some education systems have reviewed and modified their curricula, sometimes considerably, but the most recent PISA results show that school systems are not always successful in preparing students for the kinds of competencies and skills that are the foundation for success as continuing students, as skilled workers and as citizens (OECD, 2008).

Education systems in many countries, including the United Kingdom and the United States for example, were established for a workforce that may no longer play the same roles in today's economies. The following figure shows how the demand for skills has dramatically changed in the United States in the past 50 years and how routine manual tasks have given way to nonroutine analytical and interactive tasks:

Figure D ■ **Changes in the types of task input demanded in the labor market in the United States economy since 1960**



Sources: Autour, Levy and Murnane (2003) and updated in Levy, 2010, "How Technology Changes Demands for Human Skills," *OECD Education Working Papers*, No. 45, OECD Publishing, Paris.

The links between 21st-century skills, competencies and Deeper Learning

In the context of education reform efforts in many countries, including the United States, one designation for these types of 21st-century competencies and skills is "Deeper Learning" that has been defined in a recent report by the National Research Council (NRC) as "the process through which a person becomes capable of taking what was learned in one situation and applying it to new situations – in other words, learning for 'transfer'" (NRC, 2012).

There are also other examples and applications of the same general approach internationally, such as the Canadian Education Association's focus on students' intellectual engagement as part of "deep conceptual learning" (Dunleavy and Milton, 2010) and the focus of the Specialist Schools and Academies Trust in the United Kingdom on "assessment for learning, student voice, and learning to learn" to achieve "high meta-cognitive control and generic skills of learning" (Sims, 2006).

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Another approach, advocated by the Partnership for 21st-Century Skills (P21) and [EdLeader21](#), focuses on “the 4 Cs” – *Critical thinking, Communication, Collaboration and Creativity* – as required competencies for success in college, career and citizenship today (Greenhill and Kay, 2013). In most of these frameworks, non-cognitive competencies such as resilience, conscientiousness, metacognition and self-direction are also emphasized as critical for positive adult outcomes in life and career.

Implications for educators today

Not only must knowledge and information that are shared in schools, and skills that are developed, provide students with a foundational base, but schools must also help prepare students for the challenges they will face in the future as university students, as workers and as citizens. Schools and local educators must increasingly shift from a model that required routine practices to one that prepares students *today* to compete for jobs *tomorrow* that require a work ethic, collaboration, good communication, listening skills, social responsibility, critical thinking and problem solving (Greenhill and Kay, 2013). Curricular content therefore needs to be re-examined in order to see what changes are necessary to provide children with the knowledge, skills and character traits they need to succeed in the 21st century.

The NRC report sets out three broad domains of competence: *cognitive, intrapersonal and interpersonal* and notes that available empirical evidence suggests that these can be taught and learned. For educators, the report also notes that emerging empirical evidence suggests the following teaching methods:

- Employing multiple and varied representations of concepts and tasks (representations, simulations, diagrams and teacher support)
- Encouraging questioning, explanation and elaboration by students
- Engaging students in challenging tasks and providing guidance in their own learning processes
- Employing relevant examples and clear cases that students can model
- Fostering student motivation by linking learning to interests and real-world applications of knowledge and skills, and
- Employing formative assessments that can inform teachers and students to adjust teaching and learning strategies.

In short, schools and educators today need to not only help students successfully enter the workforce of the 21st century, but they must also help students become effective lifelong learners.

To find out more about 21st-century learning and teaching, go to:

- [Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World – Background Report for the International Summit on the Teaching Profession](#)
- [Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century](#)
- [EdLeader21](#)
- [Partnership for 21st Century Skills](#)

Sources: Autour, D.H., F. Levy, and R.J. Murnane (2003), “The Skill Content of Recent Technological Change: An Empirical Exploration.” *Quarterly Journal of Economics*, Vol. 118, pp. 1279-1334.

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Dunleavy, J. and P. Milton (2010), "[Student Engagement for Effective Teaching and Deep Learning](#)," *Education Canada*, Vol. 48, No. 5, Canadian Education Association.

Greenhill, V. and K. Kay (2013), *The Leader's Guide to 21st-Century Education: 7 Steps for Schools and Districts*, Pearson Education Inc.

Levy (2010), "[How Technology Changes Demands for Human Skills](#)," *OECD Education Working Papers*, No. 45, OECD Publishing, Paris.

National Research Council (2012), "[Education for Life and Work: Developing Transferable Knowledge and Skills in the 21st Century](#)," National Academic Press.

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OECD (2008), [21st Century Learning: Research, Innovation and Policy: Directions from Recent OECD Analyses](#), OECD Publishing, Paris.

OECD (2012f), [Preparing Teachers and Developing School Leaders for the 21st Century: Lessons from around the World](#), OECD Publishing, Paris.

Sims, E. (2006), [A New Shape for Schooling? Deep Learning](#), Specialist Schools and Academies Trust.

Box 5.9 What PISA shows regarding student achievement in mathematics

Results from PISA have shown that certain learning and teaching strategies are associated with higher student performance in mathematics. During PISA 2003, when mathematics was the major domain in PISA for the first time, disciplinary climate was the leading teaching-related variable that showed a strong association with better performance. Learning environments have improved across OECD countries and economies since 2003, but PISA 2012 results show that the disciplinary climate tends to be better in schools not suffering from teacher shortages (OECD, 2013a).

PISA shows that factors such as lack of punctuality, students' confidence in their ability to perform and their anxiety when dealing with mathematics problems consistently play a large role when it comes to performance. School leaders and local educators are increasingly looking at how effective strategies can be fostered within schools and classrooms to enhance the learning environment and improve learning outcomes, in particular for students from disadvantaged backgrounds (OECD, 2012a). The following are some of the findings from PISA with regards to students' achievement in mathematics:

- *Although many students reported a strong sense of belonging in PISA 2012, more than one in three students across OECD countries reported that they had arrived late for school in the two weeks prior to the PISA test, and more than one in four students reported that they had skipped classes or days of school during the same period.*

While it is clear that being tardy for school and skipping classes are negatively associated with student performance, there is little difference in the prevalence of truancy between advantaged and disadvantaged students. Across OECD countries, 19% of disadvantaged students reported that they had skipped classes, compared with 17% of advantaged students. Arriving late for school is associated with a 27-point lower score in mathematics, while skipping classes or days of school is

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associated with a 37-point lower score in mathematics – the equivalent of almost one full year of formal schooling.

PISA shows that teacher-student relations help prevent truancy and are strongly associated with students' engagement with and at school.

In almost all countries and economies that participated in PISA, students who attend schools with better teacher-student relations are less likely to report that they had arrived late during the two weeks prior to the PISA test. Moreover, in all countries and economies, among students with equal performance and similar socioeconomic status, *those who attend schools with better teacher-student relations reported a stronger sense of belonging and greater intrinsic motivation to learn mathematics.*

- PISA results indicate that *a student's strong sense of his or her own ability to learn mathematics is strongly associated with performance. Students who are more perseverant and more open to problem solving perform at higher levels in mathematics.*

For example, students who feel they can handle a lot of information, who are quick to understand and seek explanations for things and who like to solve complex problems score 30 points higher in mathematics, on average, than those who are less open to problem solving. Among high achievers, the difference between the two groups of students is even greater – an average of 38 score points, nearly the equivalent of a year's schooling.

Parents' expectations are also positively associated not only with students' mathematics performance but also with positive dispositions toward learning.

Across the 11 countries and economies that distributed questionnaires to parents, students whose parents have high expectations for them – who expect them to earn a university degree and work in a professional or managerial capacity later on – tend to have more perseverance, greater intrinsic motivation to learn mathematics and more confidence in their own ability to solve mathematics problems than students of similar socioeconomic status and academic performance whose parents hold less ambitious expectations for them.

- PISA results have also shown that *student attitudes such as motivation and confidence are strongly associated with higher performance, while a student's negative self-belief can manifest itself in anxiety toward mathematics. Some 30% of students reported that they feel helpless when doing mathematics problems.*

In many countries, students' motivation, self-belief and disposition toward learning mathematics are positively associated not only with how well they perform in mathematics but also with how much better these students perform compared with other students in their school. On the other hand, across OECD countries, greater mathematics anxiety is associated with a 34-point lower score in mathematics – the equivalent of almost one year of school. Between 2003 and 2012, mathematics self-efficacy tended to increase in those countries that also showed reductions in students' level of mathematics anxiety.

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- PISA results also reveal that *even when girls perform as well as boys in mathematics, they report less perseverance, less openness to problem solving, less motivation to learn mathematics and higher levels of anxiety toward mathematics than boys, on average; they are also more likely than boys to attribute failure in mathematics to themselves rather than to external factors.*

In 38 participating countries and economies, the average girl underperforms in mathematics compared with the average boy by 11 score points. In addition, across OECD countries 15% of boys compared with 11% of girls achieve at the highest levels of proficiency in mathematics. However, PISA reveals that the gender gap, even among the highest-achieving students, is considerably narrower when comparing boys and girls with similar levels of drive, motivation and self-belief in mathematics.

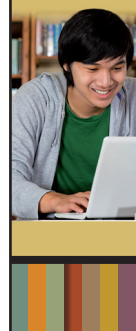
Last but not least, teachers' knowledge, skills and approaches to mathematics (and science) should continuously be updated so that concepts taught in the classroom remain relevant. Exchanging information, resources and expertise among educators and others such as researchers and universities may help keep curricula current. Local educators and school leaders should foster effective teaching and learning strategies that address issues such as disciplinary problems, additional instruction time in school and ways to boost students' confidence in their ability to solve mathematics problems.

The importance of these factors with regard to students' mathematics performance is the reason that the results for your school include information on disciplinary climate, teacher-student relations and students' attitudes toward learning (e.g., instrumental motivation and self-efficacy in mathematics and science).

To find out more about effective teaching and learning strategies in the classroom, go to:

- [PISA Brief on Gender: Are boys and girls equally prepared for life?](#)
- [PISA in Focus 35: Who are the school truants?](#)
- [PISA 2012 Results: Ready to Learn – Students' Engagement, Drive and Self-Beliefs \(Volume III\)](#)
- [Creating Effective Teaching and Learning Environments: First Results from TALIS](#)

Sources: OECD (2009a), [Creating Effective Teaching and Learning Environments: First Results from TALIS](#), OECD Publishing, Paris. OECD (2013a), [PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices \(Volume IV\)](#), OECD Publishing, Paris.



Box 5.10 **What PISA shows regarding student achievement in science**

Educators across OECD countries are mindful of today's challenges of meeting a growing demand for science-related qualifications among young adults entering the workforce. In 2006, PISA focused on science by assessing students' skills and knowledge of and about science; by looking at their attitudes and engagement with science; by looking at their general appreciation of science and personal beliefs as science learners; and by evaluating whether the students thought science would be valuable for their future. While 15-year-olds in OECD countries generally reported a positive disposition toward science, only one in three students on average across OECD countries (37%) reported that they would like to work in a career involving science and only one in five (21%) reported that they would aspire to a career in advanced science. One challenge facing educators, therefore, is to ensure that students are motivated and well prepared to achieve scientific excellence in the future (OECD, 2007). How can schools foster and strengthen engagement in science-related areas and ensure that young adults leave school with the motivation and capacity to continue learning throughout life? The following are some of the insights from previous PISA cycles regarding factors surrounding student interest and achievement in science:

- ***Overall, there is a strong and direct relationship between science performance and frequency of participation in student-initiated science activities in each of the OECD countries.***

Exposure to science and engaging in science-related activities outside of school are two possible explanations for differences in student outcomes. When compared with the lowest performers in science, for the OECD countries, top performers in science – students who reach at least Level 5 and can consistently demonstrate use of their scientific understanding in support of solutions to unfamiliar scientific situations – receive about two extra hours per week of instruction in science. PISA 2006 also asked students how often they pursued activities related to science outside of school, such as watching TV programs about science or obtaining books on scientific topics. It was found that top performers in science engage in science-related activities more often than any other performance group.

As science activities mostly take place outside of school, they are more likely to be associated with students' socioeconomic backgrounds. PISA thus also looked at what happened to student performance in science after accounting for students' socioeconomic backgrounds. *PISA results show that in all countries, student-initiated science activities maintain a strong statistical relationship with performance.* Educators and schools can explore ways of encouraging all students to engage in science-related activities outside of school with the aim of helping strong performers to excel and become top performers, in turn improving science performance overall.

- ***Student experiences and dedication are important drivers of performance in science, as are student attitudes and motivations.***

Interest in a subject can influence the intensity with which a student engages in learning. To measure students' general interest in science and their interest in specific science topics, PISA 2006 asked students to provide information on their level of interest in subjects ranging from human biology to physics and on their general interest in the ways scientists design experiments. At least 50% of top performers on average across OECD countries reported being interested in all science topics they were asked about. Interest in and enjoyment of particular subjects – what PISA calls *intrinsic motivation* – affect both the degree and continuity of engagement in learning and students' depth of understanding. Furthermore, future science motivation may be an important indicator of the proportion of students likely to pursue further science studies and/or careers. Results from PISA 2006 show that students generally enjoy learning science, with an average of 80% of top performers

...



reporting that they were both interested in learning about science and had fun doing so. PISA results suggest that *educators should set a high priority on exploring and designing strategies to enable students to enjoy science.*

- Students' belief in their own ability to effectively handle tasks – what PISA calls *self-efficacy* – is often considered an important outcome of schooling. *In 49 of 57 countries (including all OECD countries) a one-unit increase in the index of self-efficacy in science represents an increase of at least 20 score points on average.* Confidence in their abilities in various subjects can bolster students' motivation, learning behaviors and general expectations for their future. Self-efficacy centers on the kind of confidence needed for students to successfully master specific learning tasks, and thus is not simply a reflection of a student's abilities and performance. The relationship between students' self-efficacy and student performance may be reciprocal; students with higher academic ability can be more confident and greater confidence, in turn, can improve their academic ability. A strong sense of self-efficacy can also affect students' willingness to take on challenging tasks and persist in tackling them; it can thus have a key impact on motivation.
- Overall, the majority of students in participating countries reported that they valued science in general; however, students also indicated that they do not necessarily relate science to their own lives or behavior. For example, while 75% of students on average reported that science helped them to understand things around them, fewer reported they thought they would use science as adults (64% on average) and only 57% of students on average agreed that science was very relevant to them. *In contrast, 80% of top performers reported that they would use science in many ways as adults.*

An implication of this evidence is that the pool of talent for future science workers might be increased by seeking to raise top and strong performers' motivation to learn science. In addition, by showing students that learning science is useful for further study and that opportunities exist for rewarding careers in science may also help incite students to see the benefits of learning science.

- *PISA 2006 results also show that female students are much less likely to choose scientific study and science careers than males.* It is therefore instructive to look at future-oriented science aspirations according to gender. Of the 28 OECD countries included in this comparison, 12 showed that male top performers in science had significantly higher aspirations to use science in the future. Yet, the overall aspiration pattern among science top and strong performers is the same for both sexes. So, the goal of increasing the numbers of adults engaged in the study and pursuit of scientific activities by fostering aspirations is valid for both.
- Educators and schools also would like to know how well they prepare students for future science-related careers. While at least 80% reported that their schools had prepared them well for science-related careers, only 34% of top performers in science reported being informed about employers or companies that hire people to work in science-related careers. In short, *top performers perceived themselves to be well prepared by their schools for a science-related career, but not as informed about the careers available.* This is an area where schools can develop ways to give students information about future job prospects.

Fostering interest and motivation in science is an important policy goal. Efforts to this end may relate to improved instructional techniques and a more engaging learning environment at school, but they can also extend to students' lives outside school, such as making more and better content on the Internet more accessible or encouraging students to read more science-fiction novels, adventure stories or mysteries based on scientific and technical knowledge, ingenuity and solutions with characters (OECD, 2009c).

...



By and large, educational excellence goes hand in hand with promoting student engagement in and enjoyment of science learning, both inside and outside the school. The payoff is quite significant: a large and diverse talent pool ready to take up the challenge of a career in science. In today's global economy, it is the opportunity to compete on innovation and technology.

To find out more about what PISA shows regarding the highest-performing students in science, go to:

- [*PISA 2006: Science Competencies for Tomorrow's World, Vol. 1*](#)
- [*Top of the Class – High Performers in Science in PISA 2006*](#)

Sources: OECD (2007), [*PISA 2006: Science Competencies for Tomorrow's World, Vol. 1*](#), OECD Publishing, Paris.

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Annex A

THE OECD TEST FOR SCHOOLS (BASED ON PISA) IN THE UNITED STATES 2015-2016

Your school's results in this report were obtained from your decision to participate in the *OECD Test for Schools* (based on PISA). You are therefore part of a select group of schools that willingly took part in the assessment that offers a unique tool for local, national and international benchmarking for improvement.

It is therefore important to note that the schools that participated in the OECD Test for Schools in the United States are not statistically representative of schools in the country – there is of course a factor of self-selection because districts and schools freely chose to participate; hence, aggregate results of the schools that participated in the test in the United States are not presented in the school reports.

The OECD Secretariat selected NWEA to be the accredited service provider and partner for testing in the United States based on its designing and administering online assessments. NWEA was responsible for the test administration and quality-assurance procedures during all phases of the testing with the schools and districts. As such, NWEA organized the testing sessions directly with participating schools and the *school coordinators* named by each. NWEA also conducted the coding, scoring and data management of the school data. Lastly, the research team at NWEA also developed the analytical outputs for the school reports based on the specifications and guidance from the OECD.

The following table provides a summary of your school's participation in the OECD Test for Schools

School name	ARLINGTON HIGH SCHOOL
Unique identifier	74dcfc58-d547-4f9c-a3fd-c6f2059f87d9
District/local authority	Arlington School District
Location	15,000-1,00,000
State	MA
Country	USA
School type	Public
Total number of students enrolled	1272
Percentage of students eligible for free- or reduced-price lunches through the National School Lunch Program	10
Test date(s)	March 13, 2017
Student sample	85
Number of students tested	69



Annex B

OVERVIEW OF THE *OECD TEST FOR SCHOOLS* (BASED ON PISA)

The assessment instruments used as part of the *OECD Test for Schools* (based on PISA) consist of seven *test forms* of test questions in reading, mathematics and science, a *student questionnaire* that each student was expected to fill out on the day of testing and a *school questionnaire* that was filled out by school authorities at each participating school.

The test questions (items) that students responded to consisted of 141 items: 47 in reading, 40 in mathematics and 54 in science. A typical student is estimated to take approximately 92 minutes to answer the questions in each of the three subject domains, without breaks! As this is clearly not possible, the test questions were organized into clusters of questions that were then organized into test forms, for a total of seven different forms. Each student is randomly assigned a test form by the testing system. With this design, each booklet takes 120 minutes to complete, to match the PISA main studies and provide students a similar test experience.

The 141 items that make up the test were developed and selected based on the PISA assessment frameworks and the design blueprints for the test. An important part of the test design was to arrive at questions that mirror the questions used in the PISA 2009 main study with regard to *aspect*, *text format* and *text type* variables for reading; *process*, *content* and *context* variables for mathematics items; and *competency*, *knowledge about* and *knowledge of science* variables.

For the development of the test, item-response types were also a design factor during item development and for the final instruments. The goal was to mirror as closely as possible the distribution of response types of the main PISA study. One important aspect of the final assessment items of the *OECD Test for Schools* is that all three domains are equally represented in terms of testing time (approximately 92 minutes per subject domain as described above), which is the PISA standard for minor domains in every cycle.

Table A. **Items included in assessment by subject domain and response types**

	READING	MATHEMATICS	SCIENCE	Total	%
Simple Multiple Choice	19	11	18	48	34
Complex Multiple Choice	7	3	15	25	18
Constructed Response – Manual	5	25	1	31	22
Constructed Response – Expert	16	1	20	37	26
Totals	47	40	54	141	

Like the international PISA test, the *OECD Test for Schools* is developed around units. A unit consists of stimulus material, including texts, diagrams, tables and/or graphs, followed by questions on various aspects of the text, diagram, table or graph, with the questions constructed so tasks that students have to undertake are as close as possible to those they might come across in the real world. Example questions developed for the test are included in Annex C, and you can see all of the publicly available PISA questions in the publication [Take the Test: Sample Questions from OECD's PISA Assessments](#).



Annex C

EXAMPLES OF TEST QUESTIONS

This annex provides examples of test questions that are indicative of the types of questions students had to work through in the assessment. For a more complete set of PISA test questions, readers are invited to look through the reading, mathematics and science items included in [Take the Test: Sample Questions from OECD's PISA Assessments](#), [Try the Test: Explore PISA 2012 Mathematics, Problem Solving and Financial Literacy Test Questions](#), and the [PISA 2012 Results \(Volume I\)](#).



EXAMPLES OF TEST QUESTIONS

Reading

Indian Mystic is ranked between medium and difficult on the item map. It asks students to integrate and interpret information gathered from a text and form a broad understanding.

1. INDIAN MYSTIC CLAIMS NOT TO EAT FOR 70 YEARS

By Benjamin Radford, LiveScience

An 82-year-old man in India is claiming to have not had anything to eat or drink since 1940 – and doctors from the Indian military are allegedly studying him to learn his secret.

The man, Prahlad Jani, is being observed in a Gujarat hospital. Jani claims to be a breatharian – someone who does not need to eat or drink, because he draws nourishment from the air and from meditation.

As remarkable as his story is, Jani is not the first, nor the only, person to claim such a supernatural power. The claim that people can live without food or water is called inedia, and is actually somewhat of a common claim among religious fakirs of India. Unfortunately, none of the cases have withstood scientific scrutiny. The human body needs both food and water to function; it's as simple as that.

It's easy for anyone to claim that he or she has not had anything to eat or drink for the past few weeks or months (or years). But unless the person has been carefully and continuously watched during that time, it's impossible to prove the assertion.

Several people who have claimed to survive without food or water were later caught eating and drinking. It can take only a few seconds to eat something, and other than in specific areas such as prisons, conducting a close around-the-clock surveillance on a person is not easy. Often the person will ask for privacy to sleep or go to the bathroom (which is suspicious in its own right) – and then snack surreptitiously. One well-known breatharian advocate in the 1980s, a man named Wiley Brooks, claimed he did not eat yet was caught consuming junk food.

This is not the first time that Jani has made this claim. He was examined in 2003, for about a week, during which time he apparently did not eat or exercise – but he did lose weight. If Jani's abilities are real, it seems odd that he would lose weight during the time that his food intake was being monitored. If he truly gets all the sustenance he needs from air and meditation, there's no reason he would lose weight when he doesn't eat.

Reports claim that Prahlad Jani "has now spent six days without food or water under strict observation and doctors say his body has not yet shown any adverse effects from hunger or dehydration." Assuming the claim is true – and it's not clear just how strict the observation is – Jani's inedia so far remains unproven. If he really doesn't need food or water, he should be under close observation for months or years to prove it. Given that he claims not to have consumed anything since World War II, this shouldn't be a problem.



Refer to the newspaper article “Indian Mystic” on the previous page to answer the questions that follow.

INDIAN MYSTIC – QUESTION 1

What is the author’s attitude toward the idea that people can survive without food and water? Give a reason for your answer by using information from the article.

Scoring

Question intent

Integrate and interpret: Develop an interpretation

Identify an author’s attitude in a persuasive text.

Full Credit

Refers to the idea that the author does not believe in inedia and provides evidence to support this. May quote directly from the text.

- The author doesn’t believe people can survive without food or drink because he says the human body needs both food and water to function: it’s as simple as that.
- The author doesn’t believe in inedia. He says it’s easy for anyone to claim they haven’t had any food or water for weeks or months.
- He uses examples of people making similar claims being caught eating or drinking so he doesn’t believe in this.
- He doesn’t trust Jani because he says he lost weight while he was being monitored and that wouldn’t happen if it was real.

No Credit

Gives an insufficient or vague response.

- He doesn’t agree.
- The author doesn’t believe Jani.
- He thinks it is untrue.
- It’s unproven.

Shows inaccurate comprehension of the material or gives an implausible or irrelevant response.

- He thinks it might be true but we need more studies.
- The author thinks Jani is amazing.
- He thinks the doctors didn’t do a good job.

Comment

The intent of the question is to identify an author’s attitude in a persuasive text. Students are required to detect, understand and refer to methods of conveying an attitude in a text, instances of which are varied and spread across the extent of the text. The item relates to a continuous text of the type *argumentation*, and has a *personal situation* (i.e., it relates to the intellectual interests of the reader). It requires students to integrate and interpret elements of a text that presents what is intended to be a rational argument about what is perceived to be an irrational position. Reading literacy is applied to a real-world (but unusual) investigation of a social phenomenon. The item can be considered as not difficult. While the item allows for sophisticated responses to textual features such as the connotation of vocabulary, credit for responses could also be achieved through the recognition of direct statements of opinion. This wide range of credit-worthy responses contributes to the relative easiness of the item.



Mobile Phone Plans is ranked medium on the item map. It asks students to integrate and develop an interpretation with information gathered from a text as well as recognize different descriptions in a text.

2. MOBILE PHONE PLANS

DIGI 1 Mobile Phone Contract Plans (1 year)



Digi 1 – Your number 1 mobile phone company

PLANS	Minimum monthly commitment fee	Call charges (per minute) ¹		SMS charges (per SMS) ²		Benefits
		Digi 1 to Digi 1	Digi 1 to others	Digi 1 to Digi 1	Digi 1 to others	
FREEDOM Want a lower monthly access fee? This is the best plan!	1,200 zeds	Peak (7 a.m. – 7 p.m.)		1 zed	3 zeds	<ul style="list-style-type: none"> 600 zeds talk time each month – Value Extras™ not included. Access to one of the Value Extras™ add-ons for only 200 zeds extra per month.
		6 zeds	6 zeds			
		Off Peak (7 p.m. – 7 a.m.)				
		3 zeds	6 zeds			
FLEXI FIRST This plan gives you more for less!	1,800 zeds	3.5 zeds	4 zeds	2 zeds	3 zeds	<ul style="list-style-type: none"> 1,800 zeds talk time each month – Value Extras™ not included. Choose one of the Value Extras™ add-ons for free!
VALUE PLUS Keep on talking and never miss a call again.	5,000 zeds	2 zeds	3 zeds	0.5 zeds	4 zeds	<ul style="list-style-type: none"> 5,000 zeds talk time each month. Free 5-minute calls to other Digi 1 numbers. Choose one of the Value Extras™ add-ons for free.

1. Calls are charged in 30-second blocks for all rate plans.

2. SMS charges to international mobiles are 10 zeds/SMS on all plans.

FREE VALUE ADDED SERVICES

- You get Caller Line Identification Presentation and Voicemail.

VALUE EXTRAS™ ADD-ON PACKAGES

WEEKEND	Receive 50% off on all Digi 1 to Digi 1 weekend calls for only 200 zeds extra a month.
TEN	Free SMSs and free 10-minute off peak* calls to TEN of your favorite Digi 1 numbers for only 200 zeds extra a month.
SMS	500 SMSs to Digi 1 numbers for only 200 zeds extra a month.

*7 p.m. – 7 a.m. weekdays.



“Mobile Phone Plans” contains information about the yearly contract plans a mobile phone company, Digi 1, offers in a country, Zedland.

Use “Mobile Phone Plans” to answer the questions that follow.

MOBILE PHONE PLANS – QUESTION 1

List two advantages the Value Plus plan offers over the Flexi First plan.

1.
2.

Scoring

Question intent

Integrate and interpret: Develop an interpretation

Recognize different descriptions in a text.

Full Credit

Refers to two or more of the following, in any order:

- Value of included calls/SMSs each month;
- SMS charges to other Digi 1 customers;
- Call costs;
- Free calls.
- 1. It includes 5,000 zeds of call value each month.
- 2. The calls and SMS charges to other Digi 1 numbers are lower.
- 1. It includes more talk time each month.
- 2. It includes free calls to other Digi 1 numbers.
- 1. The calls and SMS charges to other Digi 1 numbers are lower.
- 2. It includes free calls to other Digi 1 numbers.
- The call and SMS charges to other Digi 1 numbers are lower and the cost of calls and SMS is included in the monthly fee.
- It includes free calls to other Digi 1 numbers and it includes more value in the monthly fee.

Partial Credit

Refers to one of either value of calls included, SMS costs, call costs or free calls:

- It includes 5,000 zeds of value each month.
- The fees for the calls are cheaper.
- The SMSs to other Digi 1 numbers are cheaper.
- It includes free calls.

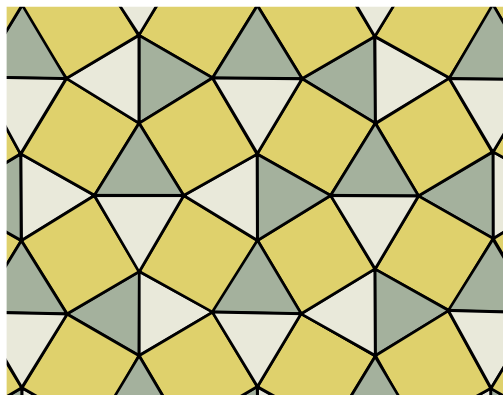
No Credit

Shows inaccurate comprehension of the material or gives an implausible or irrelevant response.

- It is better value than the Flexi First plan. [*Irrelevant.*]
- You never miss a call again. [*Irrelevant.*]
- You get a free add-on. [*Inaccurate.*]
- You have more zeds.

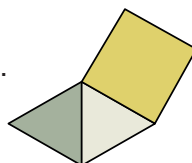
**Mathematics**

Tiling Pattern is ranked between medium and difficult on the item map. It asks a student to look at space and shape in order to find an interior angle.

5. TILING PATTERN

This is a tiling pattern on a floor.

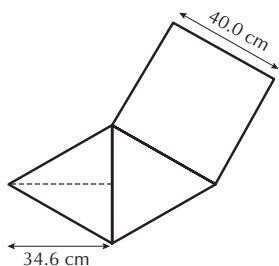
A shape that repeats within the pattern is shown here.



The repeating shape is a square and two equilateral triangles joined together.

TILING PATTERN – QUESTION 2

The height of each triangle and the length of the sides are shown.



What is the area of the repeating shape?

Show your work.

.....

.....

.....

Area = cm^2



Scoring

Question intent

Description: Calculate area of compound shape within a given tessellation

Mathematical content area: Space and shape

Context: Societal

Process category: Employing

Full Credit

2,984 [work not required]

Partial Credit

Work shows correct method but **one** error made.

- $2 \times 20 \times 34.6 + 40 \times 40$ or equivalent shown but one calculation error made
- $2 \times 40 \times 34.6 + 40 \times 40$ correctly evaluated (4,368) [forgot to halve base]
- 20×34.6 [one triangle only] + 40×40 correctly evaluated giving 2,292

Work shows correct method but **incomplete**.

- $2 \times 20 \times 34.6 + 40 \times 40$ or equivalent shown but not evaluated
- $2 \times 20 \times 34.6 + 40 \times 40 = 1,384 + \dots\dots\dots$

No Credit

Other responses.

Missing.

Which Formula is ranked medium on the item map. It asks students to create a correct formula in a context based on a linear relationship between fixed and variable costs.

6. WHICH FORMULA

Steph and Jawad run their own businesses.

Steph makes greeting cards and sells them at a market each Sunday.

Jawad is a gardener.



FORMULA?

Jawad's total charge for a gardening job is:

- a fixed charge of 20 zeds plus
- an hourly charge of 30 zeds per hour.



Write a formula that shows how Jawad's total charge, C , relates to h , the number of hours he spends on a job.

.....

.....

Scoring

Question intent

Description: Create a correct formula in a context based on a linear relationship between fixed and variable costs

Reporting category: Formulating

Mathematical content area: Change and relationships

Context: Occupational

Full Credit

An expression that shows an understanding of the relationship between total charge, fixed charge, hourly charge and hours

- $C = 30h + 20$
- $C = 20 + h \times 30$
- Charge = 30 zeds x number of hours + 20 zeds

Partial Credit

An expression that shows an understanding of the relationship between total charge, hourly charge and hours [omits fixed charge]

- $C = 30h$
- $C = h \times 30$
- Charge = 30 zeds x number of hours

No Credit

Other responses.

Missing.

Comment

This question presents students with an informal linear algebra situation in a familiar *occupational* context involving costs and charges. The world of work is becoming increasingly familiar and important for many 15-year-olds and the relationship between costs and charges, both fixed and variable, is an important one. To gain credit for this task, students need to create a correct formula in a context based on a linear relationship between fixed and variable costs. The intention of this item is to assess whether students can interpret the information provided in context, see the underlying relationships, then express the relationships symbolically using conventional algebraic notation and conventions, hence the content categorization *change and relationships*. Because the students are only required to formulate the equation and are not required to perform any calculations, perform any algebraic manipulations or use the equation in any way, the item process is categorized as formulate. Despite being a routine style of algebra question presented in an informal way, only about one out of two 15-year-olds would be expected to correctly write down the correct algebraic equation. This is partly because in most countries algebra is still a relatively new topic in school curricula for 15-year-olds. However, this is also because rather than assessing routine algebraic manipulations, the item requires genuine understanding of the underlying structure of an algebraic formula.



Science

Oil Spills is ranked medium on the item map. It asks a student to identify scientific issues related to the environment.

3. OIL SPILLS

Oil spills from ships can seriously pollute oceans, beaches and rivers. After an oil spill, booms and floating sponges are used to reduce pollution effects.



Boom in place around an oil spill

An investigation into the effect of bacteria on oil in water is made in 5 steps.

- Step 1 Half fill a screw top jar with seawater.
- Step 2 Add a sample of oil to the jar.
- Step 3 Add some liquid containing bacteria.
- Step 4 Seal the jar and leave it for several days.
- Step 5 Observe the contents of the jar.

OIL SPILLS – QUESTION 4

What parts of this investigation do not model a real oil spill in the ocean?

Scoring

Full Credit

Responses should focus on the fact that seawater in a sealed jar does not have the same conditions as real seawater.

- Doesn't model seawater because it is in a sealed container.

No Credit

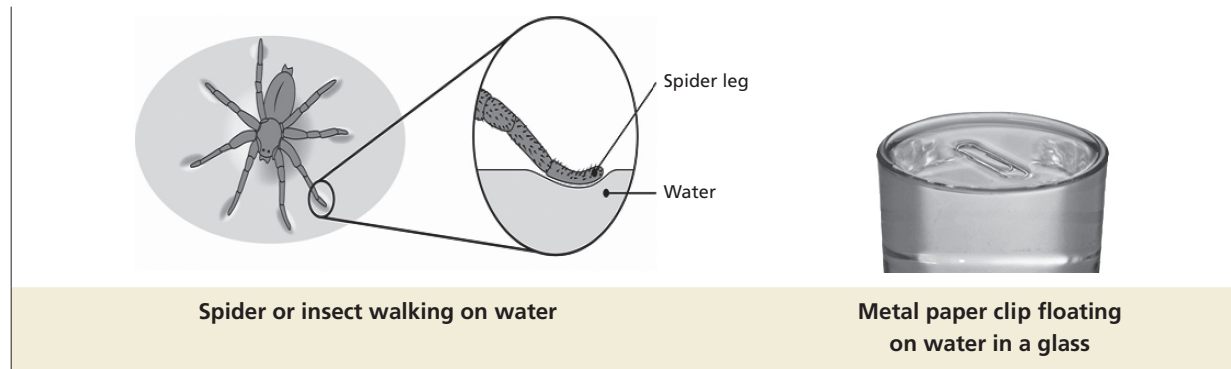
Other responses.

Missing.



Floating is ranked between medium and difficult on the item map. It asks students to explain a phenomenon scientifically.

4. FLOATING



FLOATING – QUESTION 3

Look at the pictures of the spider and the metal paper clip. What is the reason that both the spider and the paper clip can stay on top of the water?

.....

.....

Scoring

Question intent

Item type: Open-response

Competency: Explaining phenomena scientifically

Knowledge category: Physical Systems-Knowledge of science

Application area: Frontiers of science and technology

Setting: Personal

Full Credit

Mentions the surface tension of the water and/or expresses the idea of the weight of the object being spread over a large area.

- The water exerts a force that acts on the spider leg and the paper clip. The weight of the spider or the paper clip is not enough to overcome this force.
- The force of gravity on the spider and the paper clip is not enough to break the surface tension of the water.
- There is a force holding the water molecules together. If the object laying on the surface is not heavy enough then it will not break through and sink.

No Credit

Responses that do not meet the criteria for code 1.

- The spider and the paper clip are less dense than water.

Missing.



Comment

This item from the *Floating* unit is an example of a difficult question to which only about one out of five students is expected to answer correctly with full credit. Students are asked to use knowledge of science where a correct response requires an explanation of an observed scientific phenomenon: that objects with a density greater than water are able to float on water. Visual clues to assist students with their response are provided in the question stimulus. Students need to have only a broad understanding of the concept of surface tension; it is not necessary to use this term in the response to gain credit. Students needed to discriminate between aspects of the visual clues and thus a response that focused on buoyancy, for example, would not gain credit. Surface chemistry is a rapidly evolving field of science; hence the question is classified as *frontiers of science and technology*.

For a more complete set of PISA test questions, readers are invited to look through the reading, mathematics and science items included in the following OECD publication:

- [Take the Test: Sample Questions from OECD's PISA Assessments](#)





Annex D

TABLES OF RESULTS FROM PISA 2012 FOR COUNTRIES AND ECONOMIES

The tables included in this annex present summary results for all countries and economies that participated in PISA 2009 and 2012. These tables represent only a small fraction of the information provided in multiple volumes of the PISA 2012 results. To put your school's results further in context, the reader is invited to use the tables in this annex to explore basic results from PISA 2012 for a wide range of countries and economies, including the selected group of countries and economies presented throughout the report. More detailed results for all participating countries and economies can be found on the [PISA Website](#).

Notes regarding Cyprus

Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue."

Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognized by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

A note regarding Israel

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.



ARLINGTON HIGH SCHOOL

Table 1 PISA 2012 – Percentage of students at each proficiency level in reading

		All students															
		Below Level 1b (less than 262.04 score points)		Level 1b (from 262.04 to less than 334.75 score points)		Level 1a (from 334.75 to less than 407.47 score points)		Level 2 (from 407.47 to less than 480.18 score points)		Level 3 (from 480.18 to less than 552.89 score points)		Level 4 (from 552.89 to less than 625.61 score points)		Level 5 (from 625.61 to less than 698.32 score points)		Level 6 (above 698.32 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	0.9	(0.1)	3.1	(0.2)	10.2	(0.4)	21.6	(0.5)	29.1	(0.5)	23.3	(0.5)	9.8	(0.5)	1.9	(0.2)
	Austria	0.8	(0.2)	4.8	(0.6)	13.8	(0.8)	24.2	(0.9)	29.6	(0.9)	21.2	(0.9)	5.2	(0.6)	0.3	(0.1)
	Belgium	1.6	(0.3)	4.1	(0.4)	10.4	(0.6)	20.4	(0.6)	27.3	(0.7)	24.4	(0.7)	10.4	(0.5)	1.4	(0.2)
	Canada	0.5	(0.1)	2.4	(0.2)	8.0	(0.4)	19.4	(0.6)	31.0	(0.7)	25.8	(0.6)	10.8	(0.5)	2.1	(0.2)
	Chile	1.0	(0.2)	8.1	(0.8)	23.9	(1.1)	35.1	(1.1)	24.3	(1.1)	6.9	(0.6)	0.6	(0.1)	0.0	(0.0)
	Czech Republic	0.6	(0.3)	3.5	(0.6)	12.7	(0.9)	26.4	(1.3)	31.3	(1.2)	19.4	(1.1)	5.3	(0.5)	0.8	(0.2)
	Denmark	0.8	(0.3)	3.1	(0.4)	10.7	(0.8)	25.8	(0.9)	33.6	(0.8)	20.5	(0.9)	5.1	(0.6)	0.4	(0.1)
	Estonia	0.2	(0.1)	1.3	(0.3)	7.7	(0.6)	22.7	(0.9)	35.0	(1.1)	24.9	(1.1)	7.5	(0.7)	0.9	(0.2)
	Finland	0.7	(0.2)	2.4	(0.4)	8.2	(0.6)	19.1	(0.8)	29.3	(0.7)	26.8	(0.8)	11.3	(0.6)	2.2	(0.3)
	France	2.1	(0.4)	4.9	(0.4)	11.9	(0.7)	18.9	(0.8)	26.3	(0.8)	23.0	(0.7)	10.6	(0.6)	2.3	(0.4)
	Germany	0.5	(0.2)	3.3	(0.4)	10.7	(0.7)	22.1	(0.9)	29.9	(0.9)	24.6	(0.9)	8.3	(0.6)	0.7	(0.2)
	Greece	2.6	(0.4)	5.9	(0.6)	14.2	(0.8)	25.1	(1.1)	30.0	(1.0)	17.2	(1.2)	4.6	(0.6)	0.5	(0.1)
	Hungary	0.7	(0.2)	5.2	(0.6)	13.8	(0.9)	24.3	(1.2)	29.9	(1.0)	20.4	(1.0)	5.3	(0.7)	0.4	(0.1)
	Iceland	2.3	(0.3)	5.4	(0.5)	13.3	(0.6)	24.7	(0.9)	29.9	(1.1)	18.6	(1.1)	5.2	(0.4)	0.6	(0.2)
	Ireland	0.3	(0.1)	1.9	(0.4)	7.5	(0.7)	19.6	(1.2)	33.4	(1.2)	26.0	(0.9)	10.1	(0.7)	1.3	(0.3)
	Israel	3.8	(0.6)	6.9	(0.7)	12.9	(1.0)	20.8	(0.9)	25.3	(0.8)	20.6	(1.0)	8.1	(0.8)	1.5	(0.3)
	Italy	1.6	(0.2)	5.2	(0.3)	12.7	(0.5)	23.7	(0.6)	29.7	(0.5)	20.5	(0.6)	6.1	(0.3)	0.6	(0.1)
	Japan	0.6	(0.2)	2.4	(0.4)	6.7	(0.7)	16.6	(0.9)	26.7	(1.0)	28.4	(1.1)	14.6	(1.0)	3.9	(0.6)
	Korea	0.4	(0.1)	1.7	(0.4)	5.5	(0.6)	16.4	(0.9)	30.8	(1.0)	31.0	(1.1)	12.6	(1.0)	1.6	(0.3)
	Luxembourg	2.0	(0.2)	6.3	(0.3)	13.8	(0.8)	23.4	(0.7)	25.8	(0.6)	19.7	(0.6)	7.5	(0.3)	1.4	(0.2)
	Mexico	2.6	(0.2)	11.0	(0.5)	27.5	(0.7)	34.5	(0.6)	19.6	(0.5)	4.5	(0.3)	0.4	(0.1)	0.0	(0.0)
	Netherlands	0.9	(0.5)	2.8	(0.5)	10.3	(0.9)	21.0	(1.3)	29.2	(1.3)	26.1	(1.4)	9.0	(0.7)	0.8	(0.2)
	New Zealand	1.3	(0.3)	4.0	(0.5)	11.0	(0.7)	20.8	(0.8)	26.3	(1.1)	22.7	(1.1)	10.9	(0.6)	3.0	(0.4)
	Norway	1.7	(0.3)	3.7	(0.4)	10.8	(0.7)	21.9	(1.0)	29.4	(1.4)	22.3	(1.2)	8.5	(0.6)	1.7	(0.3)
	Poland	0.3	(0.1)	2.1	(0.4)	8.1	(0.7)	21.4	(0.9)	32.0	(0.9)	26.0	(1.0)	8.6	(0.8)	1.4	(0.4)
	Portugal	1.3	(0.3)	5.1	(0.5)	12.3	(1.0)	25.5	(1.2)	30.2	(1.5)	19.7	(1.1)	5.3	(0.6)	0.5	(0.1)
	Slovak Republic	4.1	(0.8)	7.9	(0.8)	16.2	(1.1)	25.0	(1.1)	26.8	(1.4)	15.7	(1.0)	4.1	(0.6)	0.3	(0.2)
	Slovenia	1.2	(0.1)	4.9	(0.4)	15.0	(0.7)	27.2	(0.8)	28.4	(0.9)	18.2	(0.6)	4.7	(0.5)	0.3	(0.1)
	Spain	1.3	(0.2)	4.4	(0.4)	12.6	(0.5)	25.8	(0.8)	31.2	(0.7)	19.2	(0.6)	5.0	(0.3)	0.5	(0.1)
	Sweden	2.9	(0.4)	6.0	(0.6)	13.9	(0.7)	23.5	(0.9)	27.3	(0.7)	18.6	(0.9)	6.7	(0.5)	1.2	(0.2)
	Switzerland	0.5	(0.1)	2.9	(0.3)	10.3	(0.6)	21.9	(0.9)	31.5	(0.7)	23.8	(0.8)	8.2	(0.6)	1.0	(0.2)
	Turkey	0.6	(0.2)	4.5	(0.6)	16.6	(1.1)	30.8	(1.4)	28.7	(1.3)	14.5	(1.4)	4.1	(0.8)	0.3	(0.1)
	United Kingdom	1.5	(0.3)	4.0	(0.5)	11.2	(0.8)	23.5	(1.0)	29.9	(1.1)	21.3	(1.1)	7.5	(0.6)	1.3	(0.2)
	United States	0.8	(0.2)	3.6	(0.5)	12.3	(0.9)	24.9	(1.0)	30.5	(0.9)	20.1	(1.1)	6.9	(0.6)	1.0	(0.2)
	OECD total	1.1	(0.1)	4.4	(0.2)	13.1	(0.3)	24.2	(0.3)	28.4	(0.3)	20.2	(0.3)	7.4	(0.2)	1.2	(0.1)
	OECD average	1.3	(0.1)	4.4	(0.1)	12.3	(0.1)	23.5	(0.2)	29.1	(0.2)	21.0	(0.2)	7.3	(0.1)	1.1	(0.0)
Partners	Albania	12.0	(0.8)	15.9	(1.0)	24.4	(1.2)	24.7	(1.0)	15.9	(0.7)	5.9	(0.6)	1.1	(0.2)	0.1	(0.1)
	Argentina	8.1	(0.8)	17.7	(1.2)	27.7	(1.3)	27.3	(1.1)	14.6	(0.9)	4.0	(0.6)	0.5	(0.2)	0.1	(0.0)
	Brazil	4.0	(0.4)	14.8	(0.6)	30.4	(0.8)	30.1	(0.8)	15.8	(0.6)	4.4	(0.4)	0.5	(0.1)	0.0	(0.0)
	Bulgaria	8.0	(1.1)	12.8	(1.2)	18.6	(1.1)	22.2	(1.2)	21.4	(1.1)	12.7	(1.0)	3.8	(0.6)	0.5	(0.2)
	Colombia	5.0	(0.8)	15.4	(1.0)	31.0	(1.3)	30.5	(1.2)	14.5	(0.9)	3.2	(0.5)	0.3	(0.1)	0.0	c
	Costa Rica	0.8	(0.2)	7.3	(1.0)	24.3	(1.2)	38.1	(1.4)	22.9	(1.4)	6.0	(0.8)	0.6	(0.2)	0.0	c
	Croatia	0.7	(0.2)	4.0	(0.6)	13.9	(1.0)	27.8	(1.1)	31.2	(1.2)	17.8	(1.1)	4.2	(0.7)	0.2	(0.1)
	Cyprus*	6.1	(0.3)	9.7	(0.4)	17.0	(0.6)	25.1	(0.8)	24.9	(0.7)	13.2	(0.6)	3.5	(0.3)	0.5	(0.1)
	Hong Kong-China	0.2	(0.1)	1.3	(0.2)	5.3	(0.6)	14.3	(0.8)	29.2	(1.2)	32.9	(1.4)	14.9	(1.0)	1.9	(0.4)
	Indonesia	4.1	(0.8)	16.3	(1.3)	34.8	(1.6)	31.6	(1.5)	11.5	(1.3)	1.5	(0.5)	0.1	(0.1)	0.0	c
	Jordan	7.5	(0.8)	14.9	(0.8)	28.3	(1.0)	30.8	(1.1)	15.5	(0.8)	2.9	(0.6)	0.1	(0.1)	0.0	c
	Kazakhstan	4.2	(0.5)	17.3	(1.2)	35.6	(1.1)	31.3	(1.1)	10.4	(0.9)	1.2	(0.2)	0.0	(0.0)	0.0	c
	Latvia	0.7	(0.2)	3.7	(0.5)	12.6	(1.0)	26.7	(1.3)	33.1	(1.1)	19.1	(0.9)	3.9	(0.6)	0.3	(0.1)
	Liechtenstein	0.0	c	1.9	(1.0)	10.5	(1.8)	22.4	(3.4)	28.6	(4.5)	25.7	(2.4)	10.4	(2.4)	0.6	c
	Lithuania	1.0	(0.2)	4.6	(0.5)	15.6	(1.1)	28.1	(1.1)	31.1	(0.9)	16.3	(0.8)	3.1	(0.3)	0.2	(0.1)
	Macao-China	0.3	(0.1)	2.1	(0.2)	9.0	(0.4)	23.3	(0.6)	34.3	(0.7)	24.0	(0.6)	6.4	(0.5)	0.6	(0.2)
	Malaysia	5.8	(0.6)	16.4	(1.0)	30.5	(1.0)	31.0	(1.1)	13.6	(1.1)	2.5	(0.5)	0.1	(0.1)	0.0	c
	Montenegro	4.4	(0.5)	13.2	(0.6)	25.7	(0.9)	29.2	(0.8)	19.9	(0.8)	6.6	(0.5)	0.9	(0.2)	0.0	(0.0)
	Peru	9.8	(0.9)	20.6	(1.1)	29.5	(1.0)	24.9	(1.0)	11.4	(1.0)	3.3	(0.6)	0.5	(0.2)	0.0	c
	Qatar	13.6	(0.3)	18.9	(0.5)	24.6	(0.4)	21.9	(0.5)	13.5	(0.4)	5.8	(0.2)	1.4	(0.1)	0.2	(0.1)
	Romania	2.5	(0.4)	10.3	(0.8)	24.4	(1.3)	30.6	(1.1)	21.8	(1.2)	8.7	(0.9)	1.5	(0.4)	0.1	c
	Russian Federation	1.1	(0.2)	5.2	(0.5)	16.0	(1.0)	29.5	(1.1)	28.3	(1.0)	15.3	(0.9)	4.2	(0.5)	0.5	(0.1)
	Serbia	2.6	(0.4)	9.3	(0.7)	21.3	(1.1)	30.8	(1.2)	23.3	(1.1)	10.5	(0.8)	2.0	(0.4)	0.2	(0.1)
	Shanghai-China	0.1	(0.1)	0.3	(0.1)	2.5	(0.3)	11.0	(0.9)	25.3	(0.8)	35.7	(1.1)	21.3	(1.0)	3.8	(0.7)
	Singapore	0.5	(0.1)	1.9	(0.3)	7.5	(0.4)	16.7	(0.7)	25.4	(0.7)	26.8	(0.8)	16.2	(0.7)	5.0	(0.4)
	Chinese Taipei	0.6	(0.1)	2.5	(0.3)	8.4	(0.7)	18.1	(0.8)	29.9	(0.9)	28.7	(1.0)	10.4	(0.7)	1.4	(0.3)
	Thailand	1.2	(0.3)	7.7	(0.8)	24.1	(1.0)	36.0	(1.1)	23.5	(1.1)	6.7	(0.8)	0.8	(0.2)	0.1	(0.0)
	Tunisia	6.2	(0.9)	15.5	(1.2)	27.6	(1.3)	31.4	(1.4)	15.6	(1.1)	3.5	(0.7)	0.2	(0.1)	0.0	c
	United Arab Emirates	3.3	(0.3)	10.4	(0.6)	21.8	(0.7)	28.6	(0.7)	24.0	(0.8)	9.7	(0.6)	2.1	(0.3)	0.2	(0.1)
	Uruguay	6.4	(0.7)	14.7	(0.8)	25.9	(0.9)	28.9	(1.0)	17.4	(0.7)	5.7	(0.6)	0.9	(0.3)	0.0	c
	Viet Nam	0.1	(0.1)	1.5	(0.5)	7.8	(1.1)	23.7	(1.4)	39.0	(1.5)	23.4	(1.5)	4.2	(0.7)	0.4	(0.2)

Source: OECD, PISA 2012 Database, Table 1.4.1a.

*See notes at the beginning of this Annex.

StatLinkS <http://dx.doi.org/10.1787/888932935724>



Table 2 PISA 2012 – Mean score, variation and gender differences in student performance in reading

		All students				Gender differences					Percentiles												
		Mean score		Standard deviation	Boys		Girls		Difference (B – G)		5th		10th		25th		75th		90th		95th		
		Mean	S.E.	S.D.	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD	Australia	512	(1.6)	97	(1.0)	495	(2.3)	530	(2.0)	-34	(2.9)	347	(3.0)	386	(2.4)	448	(2.2)	579	(1.9)	634	(2.3)	664	(3.1)
	Austria	490	(2.8)	92	(1.8)	471	(4.0)	508	(3.4)	-37	(5.0)	329	(6.3)	365	(5.1)	427	(3.9)	557	(3.0)	603	(2.5)	629	(3.7)
	Belgium	509	(2.3)	102	(1.7)	493	(3.0)	525	(2.7)	-32	(3.5)	326	(6.3)	373	(4.3)	444	(3.2)	583	(2.2)	633	(2.3)	660	(2.5)
	Canada	523	(1.9)	92	(0.9)	506	(2.3)	541	(2.1)	-35	(2.1)	363	(3.4)	403	(2.8)	464	(2.2)	587	(2.2)	638	(2.6)	667	(2.7)
	Chile	441	(2.9)	78	(1.4)	430	(3.8)	452	(2.9)	-23	(3.3)	310	(4.6)	339	(4.2)	388	(3.8)	496	(3.3)	541	(3.3)	567	(3.4)
	Czech Republic	493	(2.9)	89	(1.9)	474	(3.3)	513	(3.4)	-39	(3.7)	344	(6.0)	378	(4.7)	434	(3.7)	554	(3.6)	604	(3.8)	634	(4.3)
	Denmark	496	(2.6)	86	(2.2)	481	(3.3)	512	(2.6)	-31	(2.8)	347	(6.9)	385	(5.1)	442	(3.5)	555	(2.4)	602	(2.8)	629	(4.4)
	Estonia	516	(2.0)	80	(1.2)	494	(2.4)	538	(2.3)	-44	(2.4)	381	(4.4)	412	(3.4)	463	(3.0)	571	(2.4)	618	(2.8)	645	(4.3)
	Finland	524	(2.4)	95	(1.3)	494	(3.1)	556	(2.4)	-62	(3.1)	360	(5.7)	399	(4.3)	463	(3.5)	590	(2.3)	639	(2.5)	669	(3.5)
	France	505	(2.8)	109	(2.3)	483	(3.8)	527	(3.0)	-44	(4.2)	312	(7.7)	358	(5.4)	435	(4.3)	584	(3.6)	639	(3.9)	669	(5.0)
	Germany	508	(2.8)	91	(1.7)	486	(2.9)	530	(3.1)	-44	(2.5)	346	(5.2)	384	(4.8)	447	(3.6)	574	(3.1)	621	(3.2)	646	(3.3)
	Greece	477	(3.3)	99	(2.1)	452	(4.1)	502	(3.1)	-50	(3.7)	302	(8.8)	346	(6.0)	416	(4.5)	545	(3.4)	597	(3.9)	626	(4.5)
	Hungary	488	(3.2)	92	(1.9)	468	(3.9)	508	(3.3)	-40	(3.6)	327	(6.0)	363	(5.2)	427	(4.6)	555	(3.3)	603	(3.9)	630	(4.7)
	Iceland	483	(1.8)	98	(1.4)	457	(2.4)	508	(2.5)	-51	(3.3)	308	(5.7)	352	(4.1)	422	(2.9)	551	(2.9)	602	(2.4)	631	(3.2)
	Ireland	523	(2.6)	86	(1.7)	509	(3.5)	538	(3.0)	-29	(4.2)	373	(7.1)	410	(5.7)	469	(3.6)	582	(2.7)	631	(3.2)	659	(3.2)
	Israel	486	(5.0)	114	(2.5)	463	(8.2)	507	(3.9)	-44	(7.9)	282	(9.5)	329	(7.5)	414	(6.8)	568	(4.5)	624	(4.5)	656	(4.8)
	Italy	490	(2.0)	97	(0.9)	471	(2.5)	510	(2.3)	-39	(2.6)	317	(3.5)	359	(2.9)	427	(2.6)	559	(2.1)	609	(2.2)	636	(2.1)
	Japan	538	(3.7)	99	(2.3)	527	(4.7)	551	(3.6)	-24	(4.1)	364	(7.7)	409	(6.5)	475	(4.8)	607	(3.8)	658	(4.4)	689	(5.1)
	Korea	536	(3.9)	87	(2.0)	525	(5.0)	548	(4.5)	-23	(5.4)	382	(8.6)	424	(6.2)	483	(4.3)	596	(4.1)	640	(4.0)	665	(4.8)
	Luxembourg	488	(1.5)	105	(1.0)	473	(1.9)	503	(1.8)	-30	(2.0)	304	(3.8)	347	(2.7)	418	(2.4)	564	(2.2)	620	(2.3)	651	(2.4)
Mexico	424	(1.5)	80	(1.0)	411	(1.7)	435	(1.6)	-24	(1.4)	288	(3.0)	319	(2.5)	370	(1.9)	479	(1.8)	525	(1.9)	552	(2.0)	
Netherlands	511	(3.5)	93	(3.0)	498	(4.0)	525	(3.5)	-26	(3.1)	349	(8.3)	386	(6.6)	451	(5.1)	579	(3.7)	625	(3.6)	650	(3.8)	
New Zealand	512	(2.4)	106	(1.6)	495	(3.3)	530	(3.5)	-34	(5.0)	332	(4.7)	374	(4.9)	443	(3.2)	586	(3.1)	645	(4.0)	679	(4.9)	
Norway	504	(3.2)	100	(1.9)	481	(3.3)	528	(3.9)	-46	(3.3)	330	(8.1)	375	(4.8)	442	(4.0)	573	(3.4)	627	(3.9)	658	(4.2)	
Poland	518	(3.1)	87	(1.6)	497	(3.7)	539	(3.1)	-42	(2.9)	366	(5.9)	404	(4.6)	461	(3.2)	579	(3.6)	626	(4.8)	655	(6.2)	
Portugal	488	(3.8)	94	(1.9)	468	(4.2)	508	(3.7)	-39	(2.7)	320	(6.9)	362	(6.0)	429	(4.9)	554	(3.5)	604	(3.5)	631	(3.8)	
Slovak Republic	463	(4.2)	104	(3.3)	444	(4.6)	483	(5.1)	-39	(4.6)	274	(10.4)	321	(8.4)	396	(6.8)	538	(4.1)	591	(5.2)	620	(5.5)	
Slovenia	481	(1.2)	92	(0.9)	454	(1.7)	510	(1.8)	-56	(2.7)	324	(2.9)	362	(2.5)	420	(1.9)	548	(2.1)	598	(2.5)	626	(3.7)	
Spain	488	(1.9)	92	(1.1)	474	(2.3)	503	(1.9)	-29	(2.0)	327	(4.6)	367	(3.6)	430	(2.6)	552	(2.1)	601	(2.3)	630	(2.1)	
Sweden	483	(3.0)	107	(1.8)	458	(4.0)	509	(2.8)	-51	(3.6)	297	(6.5)	343	(5.4)	416	(4.3)	558	(3.3)	614	(4.2)	647	(4.2)	
Switzerland	509	(2.6)	90	(1.1)	491	(3.1)	527	(2.5)	-36	(2.6)	352	(4.6)	388	(3.9)	451	(3.3)	573	(2.8)	622	(3.2)	648	(3.9)	
Turkey	475	(4.2)	86	(2.4)	453	(4.6)	499	(4.3)	-46	(4.0)	335	(5.3)	365	(4.6)	417	(4.0)	534	(5.6)	588	(6.8)	620	(7.9)	
United Kingdom	499	(3.5)	97	(2.3)	487	(4.5)	512	(3.8)	-25	(4.6)	330	(7.4)	372	(7.0)	438	(4.8)	567	(3.4)	619	(3.8)	650	(4.3)	
United States	498	(3.7)	92	(1.6)	482	(4.1)	513	(3.8)	-31	(2.6)	342	(7.2)	378	(4.8)	436	(4.5)	561	(3.9)	614	(4.0)	646	(4.7)	
OECD total	495	(1.1)	97	(0.5)	479	(1.3)	511	(1.2)	-32	(0.9)	329	(1.9)	367	(1.5)	430	(1.4)	563	(1.3)	618	(1.2)	649	(1.5)	
OECD average	496	(0.5)	94	(0.3)	478	(0.6)	515	(0.5)	-38	(0.6)	332	(1.1)	372	(0.9)	435	(0.7)	563	(0.5)	613	(0.6)	642	(0.7)	
Partners	Albania	394	(3.2)	116	(2.0)	387	(3.8)	401	(3.7)	-15	(4.0)	189	(9.0)	247	(7.2)	325	(4.8)	473	(3.2)	536	(3.4)	572	(4.3)
	Argentina	396	(3.7)	96	(2.3)	377	(4.5)	414	(3.6)	-38	(3.6)	233	(7.6)	274	(5.4)	332	(4.5)	462	(4.1)	516	(4.4)	549	(5.1)
	Brazil	410	(2.1)	85	(1.2)	394	(2.4)	425	(2.2)	-31	(1.9)	271	(3.1)	302	(2.8)	353	(2.4)	468	(2.7)	520	(3.0)	552	(3.6)
	Bulgaria	436	(6.0)	119	(2.8)	403	(6.3)	472	(5.6)	-70	(5.2)	233	(9.2)	275	(8.0)	353	(8.2)	523	(6.0)	585	(6.1)	619	(6.3)
	Colombia	403	(3.4)	84	(1.9)	394	(3.9)	412	(3.8)	-19	(3.5)	262	(6.5)	295	(5.4)	348	(4.0)	460	(3.7)	509	(4.5)	540	(5.0)
	Costa Rica	441	(3.5)	74	(1.6)	427	(3.9)	452	(3.5)	-25	(2.6)	315	(5.4)	344	(5.4)	391	(4.3)	490	(4.2)	536	(5.0)	563	(4.9)
	Croatia	485	(3.3)	86	(2.1)	461	(4.1)	509	(3.3)	-48	(4.0)	337	(5.9)	370	(5.1)	427	(4.4)	546	(3.8)	593	(4.9)	622	(5.1)
	Cyprus*	449	(1.2)	111	(1.3)	418	(1.9)	481	(1.9)	-64	(3.0)	249	(4.0)	297	(3.3)	378	(2.4)	528	(2.1)	583	(2.6)	616	(3.3)
	Hong Kong-China	545	(2.8)	85	(1.8)	533	(3.8)	558	(3.3)	-25	(4.7)	391	(6.4)	430	(5.4)	493	(4.4)	604	(3.0)	648	(3.4)	672	(4.1)
	Indonesia	396	(4.2)	75	(2.7)	382	(4.8)	410	(4.3)	-28	(3.4)	270	(7.8)	299	(6.1)	346	(4.7)	447	(4.6)	492	(6.1)	517	(7.3)
	Jordan	399	(3.6)	91	(2.5)	361	(5.5)	436	(3.1)	-75	(6.3)	237	(8.4)	280	(6.4)	343	(4.5)	462	(3.2)	510	(4.6)	537	(6.4)
	Kazakhstan	393	(2.7)	74	(1.4)	374	(3.4)	411	(2.6)	-37	(2.9)	268	(4.0)	297	(4.4)	344	(3.1)	444	(3.4)	487	(3.5)	511	(4.1)
	Latvia	489	(2.4)	85	(1.7)	462	(3.3)	516	(2.7)	-55	(4.0)	341	(5.9)	375	(5.6)	434	(3.0)	548	(2.9)	593	(2.8)	619	(4.1)
	Liechtenstein	516	(4.1)	88	(4.2)	504	(6.2)	529	(5.8)	-24	(8.7)	360	(9.7)	391	(9.5)	452	(7.8)	584	(6.9)	630	(10.6)	649	(13.7)
	Lithuania	477	(2.5)	86	(1.5)	450	(2.8)	505	(2.6)	-55	(2.3)	331	(5.1)	363	(4.0)	419	(3.9)	538	(2.8)	585	(3.1)	612	(3.6)
	Macao-China	509	(0.9)	82	(0.7)	492	(1.4)	527	(1.1)	-36	(1.7)	366	(3.3)	400	(2.4)	457	(1.8)	566	(1.4)	611	(1.6)	637	(2.1)
	Malaysia	398	(3.3)	84	(1.5)	377	(3.9)	418	(3.3)	-40	(3.1)	255	(4.7)	288	(4.4)	343	(3.7)	457	(3.9)	503	(4.3)	530	(5.2)
	Montenegro	422	(1.2)	92	(1.3)	391	(2.3)	453	(1.5)	-62	(3.1)	267	(4.8)	301	(3.0)	360	(2.5)	487	(1.8)	540	(3.4)	571	(4.1)
	Peru	384	(4.3)	94	(2.3)	373	(4.0)	395	(5.4)	-22	(4.3)	231	(5.2)	263	(5.1)	319	(4.7)	447	(5.2)	504	(6.4)	540	(8.5)
	Qatar	388	(0.8)	113	(0.8)	354	(1.1)	424	(1.2)	-70	(1.6)	203	(2.4)	242	(2.0)	310	(1.7)	465	(1.9)	535	(2.3)	575	(2.3)
	Romania	438	(4.0)																				



Table 3 PISA 2012 – Percentage of students at each proficiency level in mathematics

		All students													
		Below Level 1 (below 357.77 score points)		Level 1 (from 357.77 to less than 420.07 score points)		Level 2 (from 420.07 to less than 482.38 score points)		Level 3 (from 482.38 to less than 544.68 score points)		Level 4 (from 544.68 to less than 606.99 score points)		Level 5 (from 606.99 to less than 669.30 score points)		Level 6 (above 669.30 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	6.1	(0.4)	13.5	(0.6)	21.9	(0.8)	24.6	(0.6)	19.0	(0.5)	10.5	(0.4)	4.3	(0.4)
	Austria	5.7	(0.6)	13.0	(0.7)	21.9	(0.9)	24.2	(0.8)	21.0	(0.9)	11.0	(0.7)	3.3	(0.4)
	Belgium	7.0	(0.6)	12.0	(0.5)	18.4	(0.6)	22.4	(0.7)	20.6	(0.6)	13.4	(0.7)	6.1	(0.4)
	Canada	3.6	(0.3)	10.2	(0.4)	21.0	(0.6)	26.4	(0.6)	22.4	(0.5)	12.1	(0.5)	4.3	(0.3)
	Chile	22.0	(1.4)	29.5	(1.0)	25.3	(1.0)	15.4	(0.8)	6.2	(0.6)	1.5	(0.2)	0.1	(0.0)
	Czech Republic	6.8	(0.8)	14.2	(1.0)	21.7	(0.8)	24.8	(1.1)	19.7	(0.9)	9.6	(0.7)	3.2	(0.3)
	Denmark	4.4	(0.5)	12.5	(0.7)	24.4	(1.0)	29.0	(1.0)	19.8	(0.7)	8.3	(0.6)	1.7	(0.3)
	Estonia	2.0	(0.3)	8.6	(0.6)	22.0	(0.8)	29.4	(0.8)	23.4	(0.9)	11.0	(0.7)	3.6	(0.4)
	Finland	3.3	(0.4)	8.9	(0.5)	20.5	(0.7)	28.8	(0.8)	23.2	(0.8)	11.7	(0.6)	3.5	(0.3)
	France	8.7	(0.7)	13.6	(0.8)	22.1	(1.0)	23.8	(0.8)	18.9	(0.8)	9.8	(0.5)	3.1	(0.4)
	Germany	5.5	(0.7)	12.2	(0.8)	19.4	(0.8)	23.7	(0.8)	21.7	(0.7)	12.8	(0.7)	4.7	(0.5)
	Greece	14.5	(0.9)	21.2	(0.8)	27.2	(1.0)	22.1	(0.9)	11.2	(0.8)	3.3	(0.4)	0.6	(0.1)
	Hungary	9.9	(0.8)	18.2	(1.0)	25.3	(1.2)	23.0	(1.0)	14.4	(0.9)	7.1	(0.7)	2.1	(0.5)
	Iceland	7.5	(0.5)	14.0	(0.8)	23.6	(0.9)	25.7	(0.9)	18.1	(0.8)	8.9	(0.6)	2.3	(0.4)
	Ireland	4.8	(0.5)	12.1	(0.7)	23.9	(0.7)	28.2	(0.9)	20.3	(0.8)	8.5	(0.5)	2.2	(0.2)
	Israel	15.9	(1.2)	17.6	(0.9)	21.6	(0.9)	21.0	(0.9)	14.6	(0.9)	7.2	(0.7)	2.2	(0.4)
	Italy	8.5	(0.4)	16.1	(0.5)	24.1	(0.5)	24.6	(0.6)	16.7	(0.5)	7.8	(0.4)	2.2	(0.2)
	Japan	3.2	(0.5)	7.9	(0.7)	16.9	(0.8)	24.7	(1.0)	23.7	(0.9)	16.0	(0.9)	7.6	(0.8)
	Korea	2.7	(0.5)	6.4	(0.6)	14.7	(0.8)	21.4	(1.0)	23.9	(1.2)	18.8	(0.9)	12.1	(1.3)
	Luxembourg	8.8	(0.5)	15.5	(0.5)	22.3	(0.7)	23.6	(0.7)	18.5	(0.6)	8.6	(0.4)	2.6	(0.2)
	Mexico	22.8	(0.7)	31.9	(0.6)	27.8	(0.5)	13.1	(0.4)	3.7	(0.2)	0.6	(0.1)	0.0	(0.0)
	Netherlands	3.8	(0.6)	11.0	(0.9)	17.9	(1.1)	24.2	(1.2)	23.8	(1.1)	14.9	(1.0)	4.4	(0.6)
	New Zealand	7.5	(0.6)	15.1	(0.7)	21.6	(0.8)	22.7	(0.8)	18.1	(0.8)	10.5	(0.7)	4.5	(0.4)
	Norway	7.2	(0.8)	15.1	(0.9)	24.3	(0.8)	25.7	(1.0)	18.3	(1.0)	7.3	(0.6)	2.1	(0.3)
	Poland	3.3	(0.4)	11.1	(0.8)	22.1	(0.9)	25.5	(0.9)	21.3	(1.1)	11.7	(0.8)	5.0	(0.8)
	Portugal	8.9	(0.8)	16.0	(1.0)	22.8	(0.9)	24.0	(0.8)	17.7	(0.9)	8.5	(0.7)	2.1	(0.3)
	Slovak Republic	11.1	(1.0)	16.4	(0.9)	23.1	(1.1)	22.1	(1.1)	16.4	(1.1)	7.8	(0.6)	3.1	(0.5)
	Slovenia	5.1	(0.5)	15.0	(0.7)	23.6	(0.9)	23.9	(1.0)	18.7	(0.8)	10.3	(0.6)	3.4	(0.4)
	Spain	7.8	(0.5)	15.8	(0.6)	24.9	(0.6)	26.0	(0.6)	17.6	(0.6)	6.7	(0.4)	1.3	(0.2)
	Sweden	9.5	(0.7)	17.5	(0.8)	24.7	(0.9)	23.9	(0.8)	16.3	(0.7)	6.5	(0.5)	1.6	(0.3)
	Switzerland	3.6	(0.3)	8.9	(0.6)	17.8	(1.1)	24.5	(1.0)	23.9	(0.8)	14.6	(0.8)	6.8	(0.7)
	Turkey	15.5	(1.1)	26.5	(1.3)	25.5	(1.2)	16.5	(1.0)	10.1	(1.1)	4.7	(0.8)	1.2	(0.5)
	United Kingdom	7.8	(0.8)	14.0	(0.8)	23.2	(0.8)	24.8	(0.8)	18.4	(0.8)	9.0	(0.6)	2.9	(0.4)
	United States	8.0	(0.7)	17.9	(1.0)	26.3	(0.8)	23.3	(0.9)	15.8	(0.9)	6.6	(0.6)	2.2	(0.3)
	OECD total	9.1	(0.2)	16.9	(0.3)	23.3	(0.3)	22.2	(0.3)	16.5	(0.3)	8.6	(0.2)	3.3	(0.1)
	OECD average	8.0	(0.1)	15.0	(0.1)	22.5	(0.1)	23.7	(0.2)	18.1	(0.1)	9.3	(0.1)	3.3	(0.1)
Partners	Albania	32.5	(1.0)	28.1	(1.0)	22.9	(0.9)	12.0	(0.9)	3.6	(0.3)	0.8	(0.2)	0.0	(0.0)
	Argentina	34.9	(1.9)	31.6	(1.2)	22.2	(1.4)	9.2	(0.9)	1.8	(0.4)	0.3	(0.1)	0.0	c
	Brazil	35.2	(0.9)	31.9	(0.7)	20.4	(0.7)	8.9	(0.5)	2.9	(0.3)	0.7	(0.2)	0.0	(0.0)
	Bulgaria	20.0	(1.5)	23.8	(0.9)	24.4	(1.1)	17.9	(0.9)	9.9	(0.8)	3.4	(0.5)	0.7	(0.2)
	Colombia	41.6	(1.7)	32.2	(1.0)	17.8	(0.9)	6.4	(0.6)	1.6	(0.3)	0.3	(0.1)	0.0	(0.0)
	Costa Rica	23.6	(1.7)	36.2	(1.2)	26.8	(1.3)	10.1	(1.0)	2.6	(0.5)	0.5	(0.2)	0.1	(0.1)
	Croatia	9.5	(0.7)	20.4	(1.0)	26.7	(0.9)	22.9	(1.1)	13.5	(0.8)	5.4	(0.8)	1.6	(0.5)
	Cyprus*	19.0	(0.6)	23.0	(0.7)	25.5	(0.6)	19.2	(0.6)	9.6	(0.4)	3.1	(0.2)	0.6	(0.2)
	Hong Kong-China	2.6	(0.4)	5.9	(0.6)	12.0	(0.8)	19.7	(1.0)	26.1	(1.1)	21.4	(1.0)	12.3	(0.9)
	Indonesia	42.3	(2.1)	33.4	(1.6)	16.8	(1.1)	5.7	(0.9)	1.5	(0.5)	0.3	(0.2)	0.0	c
	Jordan	36.5	(1.6)	32.1	(0.9)	21.0	(1.0)	8.1	(0.6)	1.8	(0.3)	0.5	(0.3)	0.1	(0.1)
	Kazakhstan	14.5	(0.9)	30.7	(1.4)	31.5	(0.9)	16.9	(1.1)	5.4	(0.8)	0.9	(0.3)	0.1	(0.0)
	Latvia	4.8	(0.5)	15.1	(1.0)	26.6	(1.3)	27.8	(0.9)	17.6	(0.9)	6.5	(0.6)	1.5	(0.3)
	Liechtenstein	3.5	(1.3)	10.6	(1.8)	15.2	(2.5)	22.7	(2.8)	23.2	(3.0)	17.4	(3.2)	7.4	(1.9)
	Lithuania	8.7	(0.7)	17.3	(0.9)	25.9	(0.8)	24.6	(1.0)	15.4	(0.7)	6.6	(0.5)	1.4	(0.2)
	Macao-China	3.2	(0.3)	7.6	(0.5)	16.4	(0.7)	24.0	(0.7)	24.4	(0.9)	16.8	(0.6)	7.6	(0.3)
	Malaysia	23.0	(1.2)	28.8	(1.1)	26.0	(0.9)	14.9	(0.9)	6.0	(0.7)	1.2	(0.3)	0.1	(0.1)
	Montenegro	27.5	(0.6)	29.1	(1.1)	24.2	(1.1)	13.1	(0.7)	4.9	(0.5)	0.9	(0.2)	0.1	(0.1)
	Peru	47.0	(1.8)	27.6	(0.9)	16.1	(1.0)	6.7	(0.7)	2.1	(0.4)	0.5	(0.2)	0.0	(0.0)
	Qatar	47.0	(0.4)	22.6	(0.5)	15.2	(0.4)	8.8	(0.3)	4.5	(0.3)	1.7	(0.2)	0.3	(0.1)
	Romania	14.0	(1.2)	26.8	(1.2)	28.3	(1.1)	19.2	(1.1)	8.4	(0.8)	2.6	(0.4)	0.6	(0.3)
	Russian Federation	7.5	(0.7)	16.5	(0.8)	26.6	(1.0)	26.0	(1.0)	15.7	(0.8)	6.3	(0.6)	1.5	(0.3)
	Serbia	15.5	(1.2)	23.4	(0.9)	26.5	(1.1)	19.5	(1.0)	10.5	(0.7)	3.5	(0.5)	1.1	(0.3)
	Shanghai-China	0.8	(0.2)	2.9	(0.5)	7.5	(0.6)	13.1	(0.8)	20.2	(0.8)	24.6	(1.0)	30.8	(1.2)
	Singapore	2.2	(0.2)	6.1	(0.4)	12.2	(0.7)	17.5	(0.7)	22.0	(0.6)	21.0	(0.6)	19.0	(0.5)
	Chinese Taipei	4.5	(0.5)	8.3	(0.6)	13.1	(0.6)	17.1	(0.6)	19.7	(0.8)	19.2	(0.9)	18.0	(1.0)
	Thailand	19.1	(1.1)	30.6	(1.2)	27.3	(1.0)	14.5	(1.2)	5.8	(0.7)	2.0	(0.4)	0.5	(0.2)
	Tunisia	36.5	(1.9)	31.3	(1.1)	21.1	(1.2)	8.0	(0.8)	2.3	(0.7)	0.7	(0.3)	0.1	(0.1)
	United Arab Emirates	20.5	(0.9)	25.8	(0.8)	24.9	(0.7)	16.9	(0.6)	8.5	(0.5)	2.9	(0.3)	0.5	(0.1)
	Uruguay	29.2	(1.2)	26.5	(0.8)	23.0	(0.9)	14.4	(0.9)	5.4	(0.6)	1.3	(0.3)	0.1	(0.1)
	Viet Nam	3.6	(0.8)	10.6	(1.3)	22.8	(1.3)	28.4	(1.5)	21.3	(1.2)	9.8	(1.0)	3.5	(0.7)

Source: OECD, PISA 2012 Database, Table 1.2.1a.

*See notes at the beginning of this Annex.

StatLinkS <http://dx.doi.org/10.1787/888932935724>



Table 4 PISA 2012 – Mean score, variation and gender differences in student performance in mathematics

		All students				Gender differences					Percentiles																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Mean score		Standard deviation	Boys		Girls		Difference (B – G)		5th		10th		25th		75th		90th		95th																																																																																																																																																																																																																																																																																																																																																																																																																										
		Mean	S.E.	S.D.	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.																																																																																																																																																																																																																																																																																																																																																																																																																								
		Australia	504 (1.6)	96 (1.2)	510 (2.4)	498 (2.0)	12 (3.1)	348 (2.9)	382 (2.3)	437 (2.0)	571 (2.3)	630 (3.0)	663 (3.4)	Austria	506 (2.7)	92 (1.7)	517 (3.9)	494 (3.3)	22 (4.9)	353 (4.1)	384 (3.9)	440 (3.2)	572 (3.5)	624 (3.8)	654 (4.3)	Belgium	515 (2.1)	102 (1.4)	520 (2.9)	509 (2.6)	11 (3.4)	342 (4.5)	378 (3.9)	443 (3.4)	589 (2.8)	646 (2.5)	677 (3.0)	Canada	518 (1.8)	89 (0.8)	523 (2.1)	513 (2.1)	10 (2.0)	370 (2.8)	402 (2.4)	457 (2.1)	580 (2.3)	633 (2.3)	663 (2.7)	Chile	423 (3.1)	81 (1.5)	436 (3.8)	411 (3.1)	25 (3.6)	299 (4.1)	323 (3.7)	365 (3.5)	476 (4.2)	532 (4.2)	563 (4.1)	Czech Republic	499 (2.9)	95 (1.6)	505 (3.7)	493 (3.6)	12 (4.6)	344 (6.4)	377 (4.9)	432 (3.9)	566 (3.3)	621 (3.6)	653 (4.0)	Denmark	500 (2.3)	82 (1.3)	507 (2.9)	493 (2.3)	14 (2.3)	363 (4.6)	393 (4.0)	444 (3.3)	556 (2.7)	607 (3.1)	635 (4.2)	Estonia	521 (2.0)	81 (1.2)	523 (2.6)	518 (2.2)	5 (2.6)	389 (3.5)	417 (3.0)	465 (2.7)	576 (2.7)	626 (3.2)	657 (4.1)	Finland	519 (1.9)	85 (1.2)	517 (2.6)	520 (2.2)	-3 (2.9)	376 (4.5)	409 (3.3)	463 (2.5)	577 (2.4)	629 (3.1)	657 (3.2)	France	495 (2.5)	97 (1.7)	499 (3.4)	491 (2.5)	9 (3.4)	330 (5.0)	365 (4.7)	429 (2.7)	565 (3.4)	621 (3.5)	652 (3.7)	Germany	514 (2.9)	96 (1.6)	520 (3.0)	507 (3.4)	14 (2.8)	353 (5.4)	385 (4.7)	447 (3.6)	583 (3.6)	637 (3.8)	667 (4.1)	Greece	453 (2.5)	88 (1.3)	457 (3.3)	449 (2.6)	8 (3.2)	308 (4.6)	338 (3.8)	393 (3.6)	513 (2.8)	567 (3.1)	597 (3.7)	Hungary	477 (3.2)	94 (2.4)	482 (3.7)	473 (3.6)	9 (3.7)	327 (4.6)	358 (4.2)	411 (3.3)	540 (4.8)	603 (6.4)	637 (7.9)	Iceland	493 (1.7)	92 (1.3)	490 (2.3)	496 (2.3)	-6 (3.0)	339 (4.1)	372 (2.8)	431 (2.6)	557 (3.0)	612 (3.3)	641 (3.7)	Ireland	501 (2.2)	85 (1.3)	509 (3.3)	494 (2.6)	15 (3.8)	359 (5.0)	391 (3.6)	445 (3.2)	559 (2.4)	610 (2.5)	640 (3.2)	Israel	466 (4.7)	105 (1.8)	472 (7.8)	461 (3.5)	12 (7.6)	292 (7.3)	328 (5.7)	393 (5.1)	541 (5.3)	603 (6.0)	639 (6.1)	Italy	485 (2.0)	93 (1.1)	494 (2.4)	476 (2.2)	18 (2.5)	333 (2.6)	366 (2.2)	421 (2.3)	550 (2.7)	607 (3.0)	639 (3.4)	Japan	536 (3.6)	94 (2.2)	545 (4.6)	527 (3.6)	18 (4.3)	377 (6.1)	415 (5.1)	473 (4.2)	603 (4.4)	657 (5.1)	686 (5.5)	Korea	554 (4.6)	99 (2.1)	562 (5.8)	544 (5.1)	18 (6.2)	386 (7.4)	425 (5.8)	486 (4.8)	624 (5.1)	679 (6.0)	710 (7.5)	Luxembourg	490 (1.1)	95 (0.9)	502 (1.5)	477 (1.4)	25 (2.0)	334 (3.3)	363 (3.0)	422 (1.5)	558 (1.6)	613 (2.2)	644 (2.3)	Mexico	413 (1.4)	74 (0.7)	420 (1.6)	406 (1.4)	14 (1.2)	295 (1.8)	320 (1.9)	362 (1.6)	462 (1.7)	510 (2.0)	539 (2.1)	Netherlands	523 (3.5)	92 (2.1)	528 (3.6)	518 (3.9)	10 (2.8)	367 (4.8)	397 (5.5)	457 (5.1)	591 (4.3)	638 (3.7)	665 (4.0)	New Zealand	500 (2.2)	100 (1.2)	507 (3.2)	492 (2.9)	15 (4.3)	340 (4.9)	371 (3.6)	428 (3.2)	570 (2.8)	632 (3.0)	665 (4.4)	Norway	489 (2.7)	90 (1.3)	490 (2.8)	488 (3.4)	2 (3.0)	341 (5.1)	373 (3.9)	428 (2.9)	552 (3.3)	604 (3.4)	638 (5.1)	Poland	518 (3.6)	90 (1.9)	520 (4.3)	516 (3.8)	4 (3.4)	373 (3.9)	402 (2.8)	454 (3.3)	580 (4.9)	636 (6.0)	669 (7.1)	Portugal	487 (3.8)	94 (1.4)	493 (4.1)	481 (3.9)	11 (2.5)	333 (4.5)	363 (4.2)	421 (5.0)	554 (4.3)	610 (3.9)	640 (4.1)	Slovak Republic	482 (3.4)	101 (2.5)	486 (4.1)	477 (4.1)	9 (4.5)	314 (6.7)	352 (6.2)	413 (4.2)	553 (4.7)	613 (5.3)	647 (6.7)	Slovenia	501 (1.2)	92 (1.0)	503 (2.0)	499 (2.0)	3 (3.1)	357 (3.9)	384 (2.5)	434 (2.0)	566 (2.1)	624 (2.9)	655 (4.3)	Spain	484 (1.9)	88 (0.7)	492 (2.4)	476 (2.0)	16 (2.2)	339 (3.6)	370 (3.1)	424 (2.6)	546 (2.1)	597 (2.4)	626 (2.0)	Sweden	478 (2.3)	92 (1.3)	477 (3.0)	480 (2.4)	-3 (3.0)	329 (4.4)	360 (3.5)	415 (2.9)	543 (2.7)	596 (2.9)	627 (3.6)	Switzerland	531 (3.0)	94 (1.5)	537 (3.5)	524 (3.1)	13 (2.7)	374 (3.9)	408 (3.3)	466 (3.4)	597 (3.6)	651 (4.3)	681 (4.7)	Turkey	448 (4.8)	91 (3.1)	452 (5.1)	444 (5.7)	8 (4.7)	313 (4.3)	339 (3.3)	382 (3.6)	507 (8.0)	577 (9.7)	614 (9.4)	United Kingdom	494 (3.3)	95 (1.7)	500 (4.2)	488 (3.8)	12 (4.7)	336 (4.7)	371 (5.0)	429 (4.2)	560 (3.7)	616 (4.1)	648 (5.1)	United States	481 (3.6)	90 (1.3)	484 (3.8)	479 (3.9)	5 (2.8)	339 (4.2)	368 (3.9)	418 (3.7)	543 (4.4)	600 (4.3)	634 (5.4)	OECD total	487 (1.1)	98 (0.5)	493 (1.3)	481 (1.2)	12 (1.1)	331 (1.3)	362 (1.2)	417 (1.3)	555 (1.5)	617 (1.4)	651 (1.6)	OECD average	494 (0.5)	92 (0.3)	499 (0.6)	489 (0.5)	11 (0.6)	343 (0.8)	375 (0.7)	430 (0.6)	558 (0.6)



Table 5 PISA 2012 – Percentage of students at each proficiency level in science

		All students													
		Below Level 1 (below 334.94 score points)		Level 1 (from 334.94 to less than 409.54 score points)		Level 2 (from 409.54 to less than 484.14 score points)		Level 3 (from 484.14 to less than 558.73 score points)		Level 4 (from 558.73 to less than 633.33 score points)		Level 5 (from 633.33 to less than 707.93 score points)		Level 6 (above 707.93 score points)	
		%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD	Australia	3.4	(0.3)	10.2	(0.4)	21.5	(0.5)	28.5	(0.7)	22.8	(0.6)	10.9	(0.5)	2.6	(0.3)
	Austria	3.6	(0.5)	12.2	(0.9)	24.3	(1.0)	30.1	(0.9)	21.9	(0.8)	7.0	(0.6)	0.8	(0.2)
	Belgium	5.9	(0.5)	11.8	(0.6)	21.5	(0.6)	28.7	(0.7)	23.0	(0.7)	8.1	(0.4)	0.9	(0.2)
	Canada	2.4	(0.2)	8.0	(0.4)	21.0	(0.7)	32.0	(0.5)	25.3	(0.6)	9.5	(0.5)	1.8	(0.2)
	Chile	8.1	(0.8)	26.3	(1.1)	34.6	(1.1)	22.4	(1.0)	7.5	(0.6)	1.0	(0.1)	0.0	(0.0)
	Czech Republic	3.3	(0.6)	10.5	(1.0)	24.7	(1.0)	31.7	(1.2)	22.2	(1.0)	6.7	(0.5)	0.9	(0.2)
	Denmark	4.7	(0.5)	12.0	(0.7)	25.7	(0.8)	31.3	(0.9)	19.6	(0.8)	6.1	(0.7)	0.7	(0.2)
	Estonia	0.5	(0.1)	4.5	(0.4)	19.0	(0.9)	34.5	(0.9)	28.7	(1.0)	11.1	(0.7)	1.7	(0.3)
	Finland	1.8	(0.3)	5.9	(0.5)	16.8	(0.7)	29.6	(0.8)	28.8	(0.7)	13.9	(0.6)	3.2	(0.4)
	France	6.1	(0.7)	12.6	(0.7)	22.9	(1.1)	29.2	(1.1)	21.3	(0.9)	6.9	(0.7)	1.0	(0.2)
	Germany	2.9	(0.5)	9.3	(0.7)	20.5	(0.8)	28.9	(0.9)	26.2	(1.0)	10.6	(0.8)	1.6	(0.3)
	Greece	7.4	(0.7)	18.1	(1.1)	31.0	(1.1)	28.8	(1.0)	12.2	(0.8)	2.3	(0.4)	0.2	(0.1)
	Hungary	4.1	(0.6)	14.0	(1.0)	26.4	(1.1)	30.9	(1.2)	18.7	(1.0)	5.5	(0.7)	0.5	(0.2)
	Iceland	8.0	(0.6)	16.0	(0.7)	27.5	(0.9)	27.2	(0.9)	16.2	(0.7)	4.6	(0.6)	0.6	(0.2)
	Ireland	2.6	(0.4)	8.5	(0.8)	22.0	(1.2)	31.1	(1.0)	25.0	(0.9)	9.3	(0.6)	1.5	(0.3)
	Israel	11.2	(1.1)	17.7	(0.9)	24.8	(0.9)	24.4	(1.2)	16.1	(1.1)	5.2	(0.6)	0.6	(0.2)
	Italy	4.9	(0.3)	13.8	(0.5)	26.0	(0.6)	30.1	(0.7)	19.1	(0.6)	5.5	(0.4)	0.6	(0.1)
	Japan	2.0	(0.4)	6.4	(0.6)	16.3	(0.8)	27.5	(0.9)	29.5	(1.1)	14.8	(0.9)	3.4	(0.5)
	Korea	1.2	(0.2)	5.5	(0.6)	18.0	(1.0)	33.6	(1.1)	30.1	(1.2)	10.6	(0.9)	1.1	(0.4)
	Luxembourg	7.2	(0.4)	15.1	(0.7)	24.2	(0.6)	26.2	(0.6)	19.2	(0.5)	7.0	(0.5)	1.2	(0.2)
	Mexico	12.6	(0.5)	34.4	(0.6)	37.0	(0.6)	13.8	(0.5)	2.1	(0.2)	0.1	(0.0)	0.0	c
	Netherlands	3.1	(0.5)	10.1	(0.8)	20.1	(1.3)	29.1	(1.3)	25.8	(1.2)	10.5	(1.0)	1.3	(0.3)
	New Zealand	4.7	(0.4)	11.6	(0.8)	21.7	(0.9)	26.4	(0.9)	22.3	(0.9)	10.7	(0.6)	2.7	(0.3)
	Norway	6.0	(0.6)	13.6	(0.7)	24.8	(0.8)	28.9	(0.9)	19.0	(0.8)	6.4	(0.6)	1.1	(0.2)
	Poland	1.3	(0.3)	7.7	(0.7)	22.5	(1.0)	33.1	(0.9)	24.5	(1.0)	9.1	(0.8)	1.7	(0.4)
	Portugal	4.7	(0.7)	14.3	(1.1)	27.3	(1.0)	31.4	(1.3)	17.8	(1.1)	4.2	(0.5)	0.3	(0.1)
	Slovak Republic	9.2	(0.9)	17.6	(1.1)	27.0	(1.3)	26.2	(1.6)	15.0	(1.0)	4.3	(0.6)	0.6	(0.2)
	Slovenia	2.4	(0.2)	10.4	(0.5)	24.5	(1.0)	30.0	(1.0)	23.0	(0.9)	8.4	(0.7)	1.2	(0.2)
	Spain	3.7	(0.3)	12.0	(0.5)	27.3	(0.6)	32.8	(0.6)	19.4	(0.5)	4.5	(0.3)	0.3	(0.1)
	Sweden	7.3	(0.6)	15.0	(0.8)	26.2	(0.8)	28.0	(0.8)	17.2	(0.8)	5.6	(0.4)	0.7	(0.1)
	Switzerland	3.0	(0.3)	9.8	(0.6)	22.8	(0.8)	31.3	(0.7)	23.7	(0.9)	8.3	(0.7)	1.0	(0.2)
	Turkey	4.4	(0.5)	21.9	(1.3)	35.4	(1.4)	25.1	(1.3)	11.3	(1.3)	1.8	(0.3)	0.0	c
	United Kingdom	4.3	(0.5)	10.7	(0.9)	22.4	(1.0)	28.4	(1.0)	23.0	(0.9)	9.3	(0.7)	1.8	(0.3)
	United States	4.2	(0.5)	14.0	(1.1)	26.7	(1.1)	28.9	(1.1)	18.8	(1.1)	6.3	(0.6)	1.1	(0.2)
	OECD total	4.8	(0.2)	14.6	(0.3)	25.7	(0.3)	27.5	(0.3)	19.3	(0.4)	6.9	(0.2)	1.2	(0.1)
	OECD average	4.8	(0.1)	13.0	(0.1)	24.5	(0.2)	28.8	(0.2)	20.5	(0.2)	7.2	(0.1)	1.1	(0.0)
Partners	Albania	23.5	(1.0)	29.6	(0.9)	28.5	(1.2)	14.4	(0.8)	3.6	(0.4)	0.4	(0.1)	0.0	(0.0)
	Argentina	19.8	(1.4)	31.0	(1.5)	31.1	(1.3)	14.8	(1.2)	3.0	(0.4)	0.2	(0.1)	0.0	c
	Brazil	18.6	(0.8)	35.1	(0.8)	30.7	(0.8)	12.5	(0.7)	2.8	(0.4)	0.3	(0.1)	0.0	c
	Bulgaria	14.4	(1.3)	22.5	(1.2)	26.3	(1.1)	22.5	(1.1)	11.2	(0.8)	2.8	(0.5)	0.3	(0.1)
	Colombia	19.8	(1.4)	36.3	(1.1)	30.8	(1.1)	11.0	(0.8)	1.9	(0.2)	0.1	(0.1)	0.0	c
	Costa Rica	8.6	(0.8)	30.7	(1.3)	39.2	(1.3)	17.8	(1.1)	3.4	(0.6)	0.2	(0.1)	0.0	c
	Croatia	3.2	(0.4)	14.0	(0.7)	29.1	(1.0)	31.4	(1.2)	17.6	(1.2)	4.3	(0.7)	0.3	(0.2)
	Cyprus*	14.4	(0.5)	23.7	(0.7)	30.3	(0.9)	21.3	(0.7)	8.4	(0.4)	1.8	(0.3)	0.2	(0.1)
	Hong Kong-China	1.2	(0.2)	4.4	(0.5)	13.0	(0.7)	29.8	(1.1)	34.9	(1.0)	14.9	(0.9)	1.8	(0.4)
	Indonesia	24.7	(2.0)	41.9	(1.4)	26.3	(1.5)	6.5	(1.0)	0.6	(0.3)	0.0	c	0.0	c
	Jordan	18.2	(1.2)	31.4	(1.0)	32.2	(1.0)	15.0	(0.9)	3.0	(0.6)	0.2	(0.2)	0.0	c
	Kazakhstan	11.3	(1.0)	30.7	(1.5)	36.8	(1.2)	17.8	(1.2)	3.3	(0.4)	0.2	(0.1)	0.0	c
	Latvia	1.8	(0.4)	10.5	(0.9)	28.2	(1.2)	35.1	(1.0)	20.0	(1.0)	4.0	(0.5)	0.3	(0.1)
	Liechtenstein	0.8	(0.7)	9.6	(1.9)	22.0	(3.9)	30.8	(3.8)	26.7	(2.6)	9.1	(1.5)	1.0	(1.0)
	Lithuania	3.4	(0.5)	12.7	(0.8)	27.6	(1.0)	32.9	(1.1)	18.3	(0.9)	4.7	(0.5)	0.4	(0.1)
	Macao-China	1.4	(0.2)	7.4	(0.5)	22.2	(0.6)	36.2	(0.8)	26.2	(0.7)	6.2	(0.3)	0.4	(0.1)
	Malaysia	14.5	(1.1)	31.0	(1.2)	33.9	(1.1)	16.5	(1.1)	3.7	(0.5)	0.3	(0.1)	0.0	c
	Montenegro	18.7	(0.7)	32.0	(1.0)	29.7	(0.9)	15.4	(0.8)	3.8	(0.5)	0.4	(0.1)	0.0	c
	Peru	31.5	(1.6)	37.0	(1.3)	23.5	(1.3)	7.0	(0.9)	1.0	(0.3)	0.0	c	0.0	c
	Qatar	34.6	(0.4)	28.0	(0.6)	19.6	(0.7)	11.2	(0.4)	5.1	(0.4)	1.3	(0.1)	0.1	(0.0)
	Romania	8.7	(0.8)	28.7	(1.3)	34.6	(1.2)	21.0	(1.1)	6.2	(0.8)	0.9	(0.3)	0.0	c
	Russian Federation	3.6	(0.4)	15.1	(1.0)	30.1	(1.1)	31.2	(0.9)	15.7	(1.0)	3.9	(0.5)	0.3	(0.2)
	Serbia	10.3	(1.0)	24.7	(1.2)	32.4	(1.2)	22.8	(1.1)	8.1	(0.6)	1.6	(0.4)	0.1	(0.1)
	Shanghai-China	0.3	(0.1)	2.4	(0.4)	10.0	(0.9)	24.6	(0.9)	35.5	(1.1)	23.0	(1.1)	4.2	(0.6)
	Singapore	2.2	(0.3)	7.4	(0.5)	16.7	(0.7)	24.0	(0.7)	27.0	(0.9)	16.9	(0.9)	5.8	(0.4)
	Chinese Taipei	1.6	(0.3)	8.2	(0.6)	20.8	(0.9)	33.7	(1.0)	27.3	(1.0)	7.8	(0.6)	0.6	(0.1)
	Thailand	7.0	(0.6)	26.6	(1.3)	37.5	(1.1)	21.6	(1.1)	6.4	(0.7)	0.9	(0.3)	0.1	(0.0)
	Tunisia	21.3	(1.5)	34.0	(1.1)	31.1	(1.4)	11.7	(1.0)	1.8	(0.5)	0.1	(0.1)	0.0	c
	United Arab Emirates	11.3	(0.8)	23.8	(1.0)	29.9	(0.8)	22.3	(0.9)	10.1	(0.6)	2.3	(0.2)	0.3	(0.1)
	Uruguay	19.7	(1.1)	27.2	(0.9)	29.3	(1.0)	17.1	(0.9)	5.6	(0.5)	1.0	(0.2)	0.0	(0.0)
	Viet Nam	0.9	(0.3)	5.8	(0.9)	20.7	(1.4)	37.5	(1.5)	27.0	(1.5)	7.1	(0.9)	1.0	(0.3)

Source: OECD, PISA 2012 Database, Table 1.5.1a.

*See notes at the beginning of this Annex.

StatLinkS <http://dx.doi.org/10.1787/888932935724>

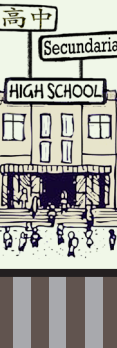


Table 6 PISA 2012 – Mean score, variation and gender differences in student performance in science

		All students				Gender differences						Percentiles											
		Mean score		Standard deviation		Boys		Girls		Difference (B – G)		5th		10th		25th		75th		90th		95th	
		Mean	S.E.	S.D.	S.E.	Mean score	S.E.	Mean score	S.E.	Score dif.	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.	Score	S.E.
OECD	Australia	521	(1.8)	100	(1.0)	524	(2.5)	519	(2.1)	5	(3.0)	353	(3.5)	391	(2.6)	453	(2.1)	592	(2.5)	650	(2.7)	682	(2.9)
	Austria	506	(2.7)	92	(1.6)	510	(3.9)	501	(3.4)	9	(5.0)	350	(4.9)	383	(5.3)	442	(3.5)	571	(3.1)	623	(3.4)	650	(3.3)
	Belgium	505	(2.2)	101	(1.5)	507	(3.0)	503	(2.6)	4	(3.6)	326	(5.8)	368	(4.5)	439	(3.3)	577	(2.5)	629	(2.0)	657	(2.7)
	Canada	525	(1.9)	91	(0.9)	527	(2.4)	524	(2.0)	3	(2.1)	370	(3.3)	407	(2.7)	467	(2.1)	588	(2.4)	639	(2.6)	670	(3.3)
	Chile	445	(2.9)	80	(1.5)	448	(3.7)	442	(2.9)	7	(3.3)	317	(4.1)	343	(3.8)	388	(3.3)	500	(3.6)	552	(3.7)	581	(3.7)
	Czech Republic	508	(3.0)	91	(2.1)	509	(3.7)	508	(3.5)	1	(4.0)	356	(7.2)	392	(5.5)	449	(4.0)	572	(3.2)	622	(3.7)	650	(3.1)
	Denmark	498	(2.7)	93	(1.7)	504	(3.5)	493	(2.5)	10	(2.7)	338	(5.9)	378	(4.3)	438	(3.8)	563	(3.2)	615	(4.1)	644	(3.7)
	Estonia	541	(1.9)	80	(1.1)	540	(2.5)	543	(2.3)	-2	(2.7)	409	(3.0)	439	(3.3)	487	(2.7)	597	(2.6)	645	(3.1)	672	(4.5)
	Finland	545	(2.2)	93	(1.2)	537	(3.0)	554	(2.3)	-16	(3.0)	386	(5.7)	424	(3.9)	486	(2.8)	609	(2.4)	662	(2.9)	692	(2.6)
	France	499	(2.6)	100	(2.2)	498	(3.8)	500	(2.4)	-2	(3.7)	323	(7.8)	366	(6.0)	433	(3.4)	570	(3.0)	622	(4.1)	651	(4.7)
	Germany	524	(3.0)	95	(2.0)	524	(3.1)	524	(3.5)	-1	(3.0)	361	(5.6)	397	(4.8)	461	(3.8)	592	(3.1)	642	(3.9)	671	(3.7)
	Greece	467	(3.1)	88	(1.5)	460	(3.8)	473	(3.0)	-13	(3.1)	317	(5.2)	352	(5.1)	408	(4.5)	528	(3.5)	578	(3.6)	608	(4.1)
	Hungary	494	(2.9)	90	(1.9)	496	(3.4)	493	(3.3)	3	(3.3)	345	(6.0)	376	(4.6)	432	(4.3)	558	(3.5)	610	(4.7)	639	(4.0)
	Iceland	478	(2.1)	99	(1.5)	477	(2.7)	480	(2.9)	-3	(3.6)	310	(5.0)	348	(3.4)	413	(2.5)	548	(3.2)	603	(3.7)	635	(5.3)
	Ireland	522	(2.5)	91	(1.6)	524	(3.4)	520	(3.1)	4	(4.4)	366	(5.8)	404	(4.8)	462	(3.1)	586	(2.4)	637	(2.6)	666	(3.4)
	Israel	470	(5.0)	108	(2.1)	470	(7.9)	470	(4.0)	-1	(7.6)	286	(8.7)	328	(6.4)	396	(5.7)	548	(5.7)	608	(5.4)	640	(5.1)
	Italy	494	(1.9)	93	(1.1)	495	(2.2)	492	(2.4)	3	(2.5)	336	(3.2)	371	(2.8)	431	(2.5)	559	(2.0)	611	(2.5)	641	(2.6)
	Japan	547	(3.6)	96	(2.2)	552	(4.7)	541	(3.5)	11	(4.3)	379	(7.0)	421	(6.4)	485	(4.5)	614	(3.6)	664	(4.3)	693	(4.7)
	Korea	538	(3.7)	82	(1.8)	539	(4.7)	536	(4.2)	3	(5.1)	396	(6.3)	431	(4.9)	485	(4.0)	595	(4.1)	639	(4.3)	664	(5.3)
	Luxembourg	491	(1.3)	103	(1.0)	499	(1.7)	483	(1.7)	15	(2.2)	318	(3.6)	355	(3.1)	419	(2.2)	566	(1.9)	624	(2.9)	655	(2.9)
	Mexico	415	(1.3)	71	(0.9)	418	(1.5)	412	(1.3)	6	(1.1)	300	(2.6)	325	(2.1)	368	(1.6)	462	(1.5)	505	(1.9)	532	(2.1)
	Netherlands	522	(3.5)	95	(2.2)	524	(3.7)	520	(3.9)	3	(2.9)	357	(5.9)	393	(5.4)	458	(5.0)	591	(3.9)	641	(4.1)	667	(4.0)
	New Zealand	516	(2.1)	105	(1.4)	518	(3.2)	513	(3.3)	5	(4.9)	339	(4.5)	377	(4.5)	444	(3.0)	591	(3.1)	649	(3.0)	682	(3.9)
	Norway	495	(3.1)	100	(1.9)	493	(3.2)	496	(3.7)	-4	(3.2)	325	(6.6)	365	(5.2)	429	(3.7)	564	(3.3)	620	(3.4)	651	(3.9)
	Poland	526	(3.1)	86	(1.5)	524	(3.7)	527	(3.2)	-3	(3.0)	382	(4.7)	415	(4.0)	467	(3.3)	584	(4.0)	637	(5.0)	668	(4.9)
	Portugal	489	(3.7)	89	(1.6)	488	(4.1)	490	(3.8)	-2	(2.6)	337	(6.0)	372	(5.6)	430	(4.8)	551	(3.6)	602	(3.6)	630	(4.1)
	Slovak Republic	471	(3.6)	101	(2.8)	475	(4.3)	467	(4.2)	7	(4.5)	300	(8.5)	339	(5.7)	403	(5.2)	542	(4.0)	599	(4.9)	632	(6.3)
	Slovenia	514	(1.3)	91	(1.2)	510	(1.9)	519	(1.9)	-9	(2.8)	364	(3.0)	397	(3.5)	451	(2.2)	578	(2.0)	631	(3.2)	661	(3.3)
	Spain	496	(1.8)	86	(0.9)	500	(2.3)	493	(1.9)	7	(2.1)	349	(3.9)	384	(3.1)	440	(2.3)	557	(1.8)	605	(2.0)	632	(2.0)
	Sweden	485	(3.0)	100	(1.5)	481	(3.9)	489	(2.8)	-7	(3.3)	314	(5.3)	354	(4.7)	419	(4.1)	554	(3.2)	611	(3.4)	643	(3.1)
	Switzerland	515	(2.7)	91	(1.1)	518	(3.3)	512	(2.7)	6	(2.6)	358	(3.8)	394	(3.4)	455	(3.8)	579	(3.1)	630	(3.3)	658	(4.0)
	Turkey	463	(3.9)	80	(1.9)	458	(4.5)	469	(4.3)	-10	(4.2)	339	(3.6)	363	(3.5)	407	(3.5)	518	(5.8)	573	(6.3)	602	(5.9)
	United Kingdom	514	(3.4)	100	(1.8)	521	(4.5)	508	(3.7)	13	(4.7)	344	(5.8)	384	(4.9)	448	(4.6)	584	(3.5)	639	(3.9)	672	(5.0)
	United States	497	(3.8)	94	(1.5)	497	(4.1)	498	(4.0)	-2	(2.7)	344	(5.4)	377	(4.9)	431	(4.4)	563	(4.2)	619	(4.5)	652	(5.5)
	OECD total	497	(1.2)	98	(0.5)	498	(1.3)	495	(1.2)	3	(1.0)	337	(1.6)	371	(1.5)	428	(1.5)	566	(1.4)	623	(1.4)	655	(1.7)
	OECD average	501	(0.5)	93	(0.3)	502	(0.6)	500	(0.5)	1	(0.6)	344	(0.9)	380	(0.8)	439	(0.6)	566	(0.6)	619	(0.6)	648	(0.7)
Partners	Albania	397	(2.4)	99	(1.8)	394	(3.0)	401	(2.9)	-7	(3.2)	221	(7.0)	271	(5.2)	340	(3.5)	464	(3.0)	517	(3.3)	549	(5.2)
	Argentina	406	(3.9)	86	(2.2)	402	(4.5)	409	(4.0)	-7	(3.4)	262	(7.9)	297	(5.1)	350	(4.6)	464	(4.7)	513	(4.7)	543	(5.2)
	Brazil	405	(2.1)	79	(1.4)	406	(2.3)	404	(2.3)	2	(1.7)	280	(2.9)	306	(2.3)	351	(2.0)	456	(2.8)	507	(3.7)	538	(4.6)
	Bulgaria	446	(4.8)	102	(2.5)	437	(5.6)	457	(4.6)	-20	(4.5)	280	(7.5)	315	(5.3)	374	(5.6)	519	(5.1)	580	(6.1)	612	(6.2)
	Colombia	399	(3.1)	76	(1.6)	408	(3.4)	390	(3.6)	18	(3.4)	273	(5.2)	302	(4.6)	347	(3.4)	449	(3.5)	497	(4.0)	525	(4.2)
	Costa Rica	429	(2.9)	71	(1.6)	436	(3.5)	424	(3.2)	12	(3.2)	315	(4.1)	341	(3.3)	382	(3.6)	476	(3.6)	520	(4.9)	546	(5.5)
	Croatia	491	(3.1)	85	(1.8)	490	(3.9)	493	(3.3)	-2	(3.8)	350	(4.9)	380	(4.0)	433	(3.3)	551	(4.2)	602	(5.2)	630	(5.9)
	Cyprus*	438	(1.2)	97	(1.1)	431	(1.8)	444	(1.7)	-13	(2.5)	274	(3.3)	313	(2.9)	373	(2.0)	503	(2.4)	561	(2.5)	594	(3.4)
	Hong Kong-China	555	(2.6)	83	(1.8)	558	(3.6)	551	(3.1)	7	(4.2)	403	(7.1)	446	(5.1)	505	(3.8)	613	(3.0)	655	(3.4)	679	(3.4)
	Indonesia	382	(3.8)	68	(2.3)	380	(4.1)	383	(4.1)	-3	(3.1)	271	(5.5)	297	(4.9)	336	(3.8)	427	(4.7)	471	(6.0)	497	(7.3)
	Jordan	409	(3.1)	83	(2.0)	388	(5.4)	430	(2.9)	-43	(6.4)	271	(4.9)	303	(4.4)	355	(3.6)	466	(3.4)	514	(4.2)	542	(6.5)
	Kazakhstan	425	(3.0)	74	(1.5)	420	(3.4)	429	(3.2)	-9	(2.9)	303	(4.4)	330	(3.6)	375	(3.4)	475	(3.5)	521	(3.8)	547	(3.8)
	Latvia	502	(2.8)	79	(1.4)	495	(3.6)	510	(2.8)	-15	(3.6)	370	(5.5)	400	(4.5)	449	(3.2)	557	(3.6)	603	(3.2)	628	(4.7)
	Liechtenstein	525	(3.5)	86	(4.1)	533	(5.8)	516	(5.7)	17	(9.1)	383	(11.1)	408	(10.0)	464	(8.4)	588	(8.2)	635	(9.3)	656	(12.2)
	Lithuania	496	(2.6)	86	(1.7)	488	(3.0)	503	(2.6)	-15	(2.3)	352	(6.3)	383	(4.0)	438	(3.2)	555	(3.0)	605	(3.6)	634	(3.8)
	Macao-China	521	(0.8)	79	(0.7)	520	(1.3)	521	(1.2)	-1	(1.7)	383	(3.9)	416	(2.7)	469	(1.9)	575	(1.7)	619	(1.8)	643	(2.3)
	Malaysia	420	(3.0)	79	(1.4)	414	(3.8)	425	(3.1)	-11	(3.5)	293	(3.9)	319	(3.4)	365	(3.4)	473	(3.6)	521	(4.3)	550	(5.2)
	Montenegro	410	(1.1)	84	(1.0)	402	(1.6)	419	(1.6)	-17	(2.4)	274	(3.3)	302	(2.9)	352	(1.4)	468	(2.2)	522	(2.3)	552	(3.3)
	Peru	373	(3.6)	78	(1.9)	376	(3.5)	370	(4.6)	6	(4.0)	248	(4.6)	275	(3.8)	321	(3.4)	425	(4.4)	475	(5.4)	504	(6.5)
	Qatar	384	(0.7)	106	(0.7)	367	(1.2)	402	(1.1)	-35	(1.7)	222	(1.9)	254	(1.4)	309	(1.3)	453	(1.6)	530	(2.4)	573	(2.8)
	Romania	439	(3.3)	79	(2.0)	436	(3.7)	441	(3.5)	-5	(3.2)	316	(4.0)	340	(3.2)	383	(3.4)	492	(4.6)	543	(5.1)	573	(5.6)
	Russian Federation	486	(2.9)	85	(1.3)	484	(3.5)	489	(2.9)	-6	(2.9)	347	(3.8)	377	(4.1)	428	(3.6)	544	(3.3)	596	(4.9)	627	(5.1)
	Serbia	445	(3.4)	87	(1.9)	443	(4.0)	447	(3.8)	-4	(3.9)	303	(5.6)	333	(5.2)	385	(4.5)	504	(3.5)	558	(3.9)	590	(5.8)
	Shanghai-China	580	(3.0)	82	(1.8)	583	(3.5)	578	(3.1)	5	(2.7)	435	(6.2)	472	(5.4)	527	(3.7)	639	(3.2)	681	(3.2)	704	(3.3)
	Singapore	551	(1.5)	104	(1.2)	551	(2.1)	552	(1.9)	-1	(2.6)	374	(4.0)	412	(3.2)	480	(2.6)	627	(2.6)	681	(3.4)	714	(3.2)
	Chinese Taipei	523	(2.3)	83	(1.4)	524	(3.9)	523	(4.0)	1	(6.4)	379	(4.1)	411	(4.3)	469	(3.8)	582	(2.4)	626	(2.2)	652	(3.1)
	Thailand	444	(2.9)	76	(1.7)	433	(3.3)	452	(3.4)	-19	(3.4)	323	(4.3)	349	(3.4)	392	(2.6)	494	(3.8)	544	(5.4)	575	(6.0)
	Tunisia	398	(3.5)	79	(1.9)	399	(3.9)	398	(3.6)	1	(2.9)	267	(4.6)	296	(4.6)	345	(4.1)						

Source: OECD, PISA 2012 Database, Table 1.5.3a.

Note: Values that are statistically significant are indicated in bold.

*See notes at the beginning of this Annex.

StatLinks <http://dx.doi.org/10.1787/888932935724>



PISA 2009 – Percentage of students, by reader profile

Results based on students' self-reports

Group 1: "Wide and deep"; Group 2: "Narrow and deep"; Group 3: "Highly restricted and deep";

Group 4: "Wide and surface"; Group 5: "Narrow and surface"; Group 6: "Highly restricted and surface"

Table 7

	Group 1		Group 2		Group 3		Group 4		Group 5		Group 6	
	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.	%	S.E.
OECD												
Australia	21.0	(0.5)	13.9	(0.4)	34.2	(0.6)	5.3	(0.2)	8.2	(0.3)	17.5	(0.5)
Austria	16.6	(0.7)	33.1	(0.8)	24.1	(0.7)	3.4	(0.3)	13.3	(0.5)	9.4	(0.4)
Belgium	16.6	(0.6)	29.6	(0.6)	32.0	(0.8)	2.0	(0.2)	8.1	(0.4)	11.6	(0.5)
Canada	23.3	(0.5)	13.4	(0.3)	37.0	(0.5)	6.0	(0.2)	5.8	(0.3)	14.5	(0.4)
Chile	17.7	(0.6)	19.7	(0.7)	32.5	(0.7)	6.4	(0.4)	7.2	(0.4)	16.5	(0.6)
Czech Republic	12.5	(0.6)	35.0	(0.8)	28.0	(0.8)	1.5	(0.2)	12.2	(0.7)	10.8	(0.6)
Denmark	22.0	(0.7)	26.2	(0.7)	30.6	(0.8)	3.8	(0.3)	6.7	(0.4)	10.6	(0.6)
Estonia	17.8	(0.7)	43.1	(0.9)	19.3	(0.8)	3.1	(0.3)	10.7	(0.5)	6.0	(0.4)
Finland	20.4	(0.7)	39.3	(0.9)	17.0	(0.6)	2.1	(0.2)	13.4	(0.5)	7.9	(0.5)
France	18.5	(0.7)	27.5	(0.8)	36.8	(0.8)	1.9	(0.2)	6.2	(0.4)	9.1	(0.6)
Germany	18.3	(0.7)	22.5	(0.7)	35.9	(0.9)	3.0	(0.3)	8.7	(0.4)	11.6	(0.5)
Greece	11.6	(0.6)	22.9	(0.7)	38.6	(0.8)	3.2	(0.3)	9.0	(0.5)	14.8	(0.7)
Hungary	21.3	(0.8)	30.8	(0.9)	20.5	(0.7)	5.7	(0.5)	11.0	(0.5)	10.7	(0.6)
Iceland	18.4	(0.6)	30.3	(0.8)	20.5	(0.7)	4.5	(0.3)	12.7	(0.5)	13.5	(0.6)
Ireland	20.2	(0.8)	24.7	(0.8)	34.4	(0.9)	3.0	(0.3)	7.4	(0.5)	10.3	(0.6)
Israel	16.7	(0.5)	19.7	(0.6)	31.8	(0.9)	5.8	(0.4)	8.5	(0.4)	17.5	(0.7)
Italy	18.4	(0.4)	20.8	(0.3)	45.2	(0.5)	2.2	(0.1)	3.7	(0.2)	9.7	(0.3)
Japan	27.9	(0.9)	26.2	(0.6)	19.2	(0.6)	7.2	(0.3)	11.6	(0.7)	7.9	(0.5)
Korea	25.8	(0.9)	9.3	(0.4)	41.2	(0.9)	5.9	(0.4)	3.2	(0.3)	14.5	(0.7)
Luxembourg	19.5	(0.6)	30.1	(0.7)	21.7	(0.7)	4.1	(0.3)	13.0	(0.6)	11.7	(0.5)
Mexico	19.9	(0.3)	16.6	(0.3)	36.0	(0.4)	7.4	(0.2)	5.5	(0.2)	14.7	(0.3)
Netherlands	14.3	(0.8)	19.8	(1.0)	31.5	(0.9)	4.3	(0.3)	9.7	(0.7)	20.4	(1.3)
New Zealand	23.9	(0.7)	12.7	(0.6)	30.3	(0.7)	8.5	(0.5)	7.9	(0.4)	16.7	(0.5)
Norway	19.4	(0.7)	37.0	(0.7)	22.5	(0.7)	2.8	(0.2)	9.8	(0.5)	8.6	(0.5)
Poland	13.1	(0.6)	37.1	(0.6)	21.7	(0.6)	3.4	(0.3)	14.2	(0.6)	10.6	(0.5)
Portugal	19.2	(0.6)	24.0	(0.7)	32.1	(0.7)	4.0	(0.3)	9.0	(0.5)	11.7	(0.6)
Slovak Republic	12.8	(0.6)	39.4	(0.9)	16.8	(0.5)	3.3	(0.3)	17.7	(0.6)	10.0	(0.5)
Slovenia	10.4	(0.6)	34.5	(0.8)	20.9	(0.7)	2.7	(0.3)	18.7	(0.6)	12.9	(0.5)
Spain	19.8	(0.5)	18.7	(0.5)	41.5	(0.5)	2.9	(0.2)	5.6	(0.4)	11.6	(0.5)
Sweden	19.9	(0.7)	22.7	(0.7)	24.3	(0.6)	5.1	(0.3)	12.2	(0.5)	15.6	(0.6)
Switzerland	20.6	(0.6)	33.2	(0.8)	22.5	(0.6)	3.2	(0.2)	11.3	(0.5)	9.1	(0.5)
Turkey	24.7	(0.6)	12.8	(0.5)	24.6	(0.8)	15.5	(0.6)	8.2	(0.4)	14.2	(0.6)
United Kingdom	18.9	(0.6)	20.7	(0.5)	31.1	(0.7)	5.2	(0.3)	10.2	(0.5)	13.9	(0.6)
United States	19.0	(0.8)	10.9	(0.6)	36.7	(0.8)	6.5	(0.4)	6.4	(0.4)	20.4	(0.8)
OECD average	18.8	(0.1)	25.2	(0.1)	29.2	(0.1)	4.6	(0.1)	9.6	(0.1)	12.5	(0.1)
Partners												
Albania	35.6	(0.9)	14.7	(0.6)	23.4	(1.0)	11.5	(0.9)	6.1	(0.4)	8.7	(0.6)
Argentina	17.0	(0.8)	22.9	(0.8)	29.5	(0.9)	7.6	(0.5)	9.8	(0.6)	13.1	(0.7)
Azerbaijan	21.8	(0.9)	10.2	(0.6)	15.1	(0.7)	26.7	(1.0)	10.9	(0.6)	15.3	(0.7)
Brazil	20.9	(0.5)	15.6	(0.4)	28.9	(0.6)	10.2	(0.4)	7.9	(0.3)	16.4	(0.5)
Bulgaria	21.6	(1.5)	20.4	(0.8)	20.2	(0.7)	10.4	(0.6)	11.3	(0.6)	16.1	(1.0)
Colombia	23.9	(1.0)	22.4	(0.8)	20.9	(1.0)	11.2	(0.7)	9.5	(0.5)	12.2	(0.6)
Croatia	16.6	(0.8)	36.4	(0.7)	15.4	(0.5)	4.7	(0.3)	17.7	(0.6)	9.3	(0.5)
Dubai (UAE)	29.0	(0.7)	26.5	(0.6)	15.7	(0.6)	9.7	(0.4)	11.5	(0.5)	7.6	(0.3)
Hong Kong-China	27.7	(0.8)	13.6	(0.6)	12.3	(0.5)	19.2	(0.6)	14.2	(0.6)	13.1	(0.6)
Indonesia	32.2	(1.0)	10.6	(0.6)	14.3	(0.6)	24.6	(0.9)	6.4	(0.4)	11.9	(0.7)
Jordan	16.9	(0.6)	17.1	(0.6)	19.7	(0.6)	16.2	(0.7)	11.8	(0.5)	18.3	(0.7)
Kazakhstan	34.9	(0.8)	10.9	(0.5)	6.3	(0.4)	33.1	(1.0)	9.2	(0.4)	5.6	(0.4)
Kyrgyzstan	26.6	(1.0)	7.3	(0.4)	9.3	(0.5)	36.0	(0.9)	7.9	(0.5)	12.9	(0.5)
Latvia	20.3	(0.8)	25.1	(1.0)	17.5	(0.7)	10.1	(0.7)	14.0	(0.6)	13.0	(0.8)
Liechtenstein	22.9	(2.1)	26.5	(2.5)	20.7	(2.0)	4.6	(1.0)	11.5	(1.8)	13.8	(1.7)
Lithuania	27.6	(0.7)	25.0	(0.7)	13.4	(0.5)	9.4	(0.4)	15.2	(0.6)	9.4	(0.5)
Macao-China	20.5	(0.5)	23.0	(0.6)	18.4	(0.5)	9.8	(0.4)	14.4	(0.4)	13.8	(0.5)
Montenegro	18.6	(0.6)	23.4	(0.6)	12.2	(0.6)	14.1	(0.6)	19.3	(0.5)	12.3	(0.5)
Panama	20.7	(1.0)	16.7	(1.0)	19.3	(1.3)	16.5	(1.1)	12.6	(0.8)	14.2	(0.9)
Peru	34.2	(0.8)	16.1	(0.6)	14.6	(0.5)	18.1	(0.7)	8.0	(0.4)	9.1	(0.5)
Qatar	22.8	(0.4)	19.7	(0.4)	16.4	(0.4)	15.4	(0.4)	14.0	(0.4)	11.7	(0.3)
Romania	21.4	(0.9)	22.3	(0.8)	29.3	(1.0)	6.3	(0.4)	8.1	(0.6)	12.6	(0.7)
Russian Federation	33.9	(1.0)	12.0	(0.5)	14.8	(0.5)	18.7	(0.5)	8.9	(0.4)	11.7	(0.6)
Serbia	16.7	(0.7)	26.4	(0.6)	15.9	(0.6)	9.9	(0.4)	18.8	(0.6)	12.3	(0.4)
Shanghai-China	41.4	(0.8)	17.4	(0.6)	19.9	(0.7)	10.5	(0.5)	4.3	(0.3)	6.5	(0.4)
Singapore	39.3	(0.8)	20.0	(0.6)	19.1	(0.5)	7.6	(0.3)	6.7	(0.3)	7.4	(0.4)
Chinese Taipei	29.1	(0.9)	14.6	(0.6)	15.7	(0.5)	16.6	(0.6)	10.2	(0.4)	13.7	(0.6)
Thailand	30.7	(0.7)	9.3	(0.5)	6.5	(0.4)	33.6	(0.7)	9.4	(0.5)	10.5	(0.5)
Trinidad and Tobago	29.1	(0.8)	19.8	(0.7)	19.8	(0.5)	12.2	(0.5)	9.1	(0.4)	10.0	(0.5)
Tunisia	28.8	(0.8)	15.7	(0.7)	20.3	(0.7)	14.5	(0.8)	8.7	(0.5)	11.9	(0.5)
Uruguay	18.2	(0.5)	16.8	(0.7)	36.3	(0.6)	5.9	(0.3)	5.2	(0.3)	17.7	(0.6)

Source: OECD, PISA 2009 Database, Table III.1.27.

StatLinkS <http://dx.doi.org/10.1787/888932343285>



PISA 2009 – Reading performance, by reader profile

Results based on students' self-reports


Group 1: "Wide and deep"; Group 2: "Narrow and deep"; Group 3: "Highly restricted and deep"; Group 4: "Wide and surface"; Group 5: "Narrow and surface"; Group 6: "Highly restricted and surface"

Table 8

	Group 1		Group 2		Group 3		Group 4		Group 5		Group 6	
	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.	Mean score	S.E.
OECD												
Australia	570	(2.9)	510	(3.1)	537	(2.7)	496	(3.9)	449	(3.2)	455	(2.4)
Austria	540	(4.3)	480	(3.0)	492	(4.3)	437	(7.8)	413	(4.0)	401	(5.1)
Belgium	571	(3.4)	531	(2.8)	515	(2.7)	459	(8.2)	443	(4.1)	427	(3.8)
Canada	566	(2.0)	521	(2.9)	536	(1.6)	500	(4.0)	473	(3.4)	468	(2.4)
Chile	485	(3.7)	477	(3.5)	454	(3.7)	422	(4.3)	418	(5.1)	399	(3.9)
Czech Republic	548	(4.6)	494	(2.9)	495	(3.8)	443	(11.5)	419	(4.6)	408	(3.3)
Denmark	535	(2.9)	508	(2.6)	497	(3.2)	458	(5.8)	441	(4.4)	426	(4.4)
Estonia	541	(3.4)	510	(2.8)	501	(3.5)	464	(8.5)	446	(4.1)	435	(6.3)
Finland	601	(2.5)	543	(2.5)	533	(3.8)	522	(8.2)	474	(2.8)	448	(4.3)
France	558	(4.1)	504	(3.5)	499	(4.5)	462	(16.6)	425	(6.1)	393	(6.4)
Germany	560	(3.3)	507	(3.3)	518	(3.0)	459	(7.3)	439	(5.3)	430	(4.5)
Greece	540	(4.4)	494	(4.5)	492	(4.9)	472	(8.0)	434	(7.9)	431	(5.7)
Hungary	539	(3.9)	513	(3.4)	497	(4.7)	434	(9.0)	453	(3.8)	420	(6.4)
Iceland	564	(3.1)	516	(2.5)	507	(3.6)	479	(7.1)	452	(4.1)	430	(3.8)
Ireland	547	(4.2)	491	(3.5)	507	(3.5)	473	(9.3)	435	(6.0)	435	(6.2)
Israel	518	(4.7)	503	(4.2)	490	(4.2)	433	(7.2)	442	(5.2)	419	(4.8)
Italy	524	(2.2)	496	(1.9)	493	(1.7)	438	(5.4)	417	(4.0)	400	(4.6)
Japan	565	(3.3)	533	(3.6)	543	(3.4)	473	(5.8)	438	(7.0)	431	(7.2)
Korea	574	(3.0)	556	(4.8)	551	(2.9)	493	(5.9)	466	(6.5)	468	(5.6)
Luxembourg	537	(3.0)	476	(2.8)	490	(3.1)	450	(7.7)	417	(4.0)	398	(4.9)
Mexico	446	(2.4)	449	(2.2)	435	(2.3)	381	(3.1)	399	(2.8)	381	(2.7)
Netherlands	575	(4.7)	550	(4.7)	516	(4.9)	492	(7.0)	472	(6.7)	446	(4.9)
New Zealand	569	(3.4)	520	(4.2)	548	(3.5)	489	(5.5)	447	(5.1)	462	(4.1)
Norway	559	(3.7)	512	(2.4)	505	(3.0)	480	(8.3)	441	(4.7)	419	(5.4)
Poland	560	(4.2)	519	(2.8)	500	(3.5)	479	(7.3)	457	(3.7)	432	(4.9)
Portugal	532	(3.9)	501	(3.1)	510	(3.0)	429	(6.5)	420	(4.0)	415	(4.2)
Slovak Republic	543	(4.8)	495	(2.7)	482	(4.4)	452	(10.0)	434	(3.9)	407	(5.8)
Slovenia	555	(3.8)	504	(2.4)	500	(2.9)	468	(7.5)	440	(2.9)	426	(3.1)
Spain	532	(2.0)	489	(2.4)	484	(2.3)	448	(6.1)	422	(4.4)	411	(3.5)
Sweden	567	(3.3)	510	(3.1)	501	(4.1)	483	(6.6)	458	(3.6)	428	(3.8)
Switzerland	562	(3.1)	508	(2.5)	508	(3.1)	456	(7.0)	432	(3.1)	418	(3.9)
Turkey	482	(4.1)	480	(4.5)	488	(4.7)	428	(3.5)	439	(4.9)	433	(4.3)
United Kingdom	548	(3.5)	492	(2.9)	509	(3.4)	473	(5.5)	441	(4.5)	446	(3.5)
United States	539	(6.1)	503	(4.7)	516	(4.1)	473	(5.7)	454	(5.5)	458	(3.5)
OECD average	546	(0.6)	506	(0.6)	504	(0.6)	462	(1.3)	440	(0.8)	427	(0.8)
Partners												
Albania	410	(4.5)	392	(5.2)	392	(7.3)	353	(5.5)	348	(8.4)	335	(5.8)
Argentina	426	(6.9)	426	(5.9)	404	(5.3)	351	(7.6)	380	(6.9)	359	(5.9)
Azerbaijan	372	(4.6)	366	(5.6)	347	(4.8)	368	(3.5)	364	(5.3)	354	(4.5)
Brazil	434	(4.5)	440	(3.3)	425	(3.3)	374	(2.8)	389	(4.0)	372	(2.8)
Bulgaria	487	(8.6)	457	(6.6)	426	(7.3)	401	(7.8)	407	(6.0)	367	(6.6)
Colombia	419	(5.5)	438	(4.5)	429	(4.7)	368	(5.4)	395	(4.9)	386	(3.9)
Croatia	532	(3.8)	493	(3.1)	479	(4.4)	449	(5.8)	428	(3.6)	405	(4.8)
Dubai (UAE)	509	(2.6)	469	(2.3)	461	(3.3)	417	(4.5)	404	(3.5)	382	(5.0)
Hong Kong-China	574	(2.7)	543	(3.7)	543	(4.2)	518	(3.1)	496	(3.6)	490	(4.0)
Indonesia	423	(4.3)	420	(5.8)	394	(4.7)	389	(3.9)	385	(5.6)	372	(3.6)
Jordan	426	(3.9)	441	(3.9)	409	(4.9)	384	(4.0)	409	(4.6)	374	(4.2)
Kazakhstan	420	(4.0)	422	(4.9)	415	(8.7)	358	(2.7)	364	(4.9)	355	(6.6)
Kyrgyzstan	341	(4.7)	344	(8.1)	300	(6.5)	307	(3.4)	311	(5.1)	285	(5.0)
Latvia	521	(3.9)	505	(3.2)	491	(4.9)	456	(4.9)	453	(4.1)	431	(4.7)
Liechtenstein	563	(7.2)	510	(8.6)	495	(8.7)	443	(18.7)	446	(13.4)	444	(10.6)
Lithuania	515	(3.0)	476	(3.3)	455	(4.7)	455	(4.3)	429	(3.4)	411	(4.9)
Macao-China	522	(2.3)	495	(1.9)	488	(2.2)	480	(3.1)	466	(2.2)	444	(2.8)
Montenegro	451	(3.9)	427	(3.2)	398	(4.6)	394	(5.6)	395	(2.8)	358	(3.9)
Panama	405	(7.1)	399	(9.9)	385	(10.2)	348	(8.5)	360	(7.6)	338	(10.1)
Peru	389	(4.4)	405	(6.4)	367	(5.7)	340	(3.4)	349	(6.8)	323	(6.1)
Qatar	420	(2.9)	386	(2.7)	370	(3.4)	351	(2.9)	350	(2.6)	327	(3.0)
Romania	453	(4.9)	447	(4.6)	430	(4.1)	382	(6.5)	390	(7.6)	368	(5.6)
Russian Federation	493	(3.7)	459	(4.4)	470	(4.8)	441	(3.8)	420	(4.1)	411	(5.6)
Serbia	484	(3.8)	465	(3.1)	453	(4.1)	413	(4.4)	414	(3.3)	389	(4.0)
Shanghai-China	577	(2.9)	571	(3.6)	554	(2.9)	511	(4.5)	508	(5.7)	491	(5.3)
Singapore	566	(1.8)	525	(2.9)	527	(3.0)	472	(4.7)	452	(4.7)	439	(4.7)
Chinese Taipei	536	(3.5)	510	(3.3)	504	(3.3)	476	(3.7)	451	(3.9)	442	(4.5)
Thailand	446	(3.8)	441	(3.8)	415	(5.7)	411	(2.4)	407	(4.2)	381	(3.8)
Trinidad and Tobago	457	(3.7)	437	(4.0)	415	(4.3)	382	(4.0)	382	(5.6)	356	(5.0)
Tunisia	414	(3.5)	421	(4.2)	416	(4.2)	381	(3.9)	393	(6.1)	372	(3.8)
Uruguay	455	(3.6)	461	(4.1)	437	(3.5)	381	(5.3)	392	(5.8)	370	(3.7)

Source: OECD, PISA 2009 Database, Table III.1.28.

Notes: Values that are statistically significant are indicated in bold. Performance difference between each group and Group 1.

StatLinkS  <http://dx.doi.org/10.1787/888932343285>



ARLINGTON HIGH SCHOOL

Table 9 PISA 2012 – Response rates

		Final sample – after school replacement		Final sample – students within schools after school replacement				
		Number of responding schools (unweighted)	Number of responding and non-responding schools (unweighted)	Weighted student participation rate after replacement (%)	Number of students assessed (weighted)	Number of students sampled (assessed and absent) (weighted)	Number of students assessed (unweighted)	Number of students sampled (assessed and absent) (unweighted)
OECD	Australia	757	790	87	213,495	246,012	17,491	20,799
	Austria	191	191	92	75,393	82,242	4,756	5,318
	Belgium	282	294	91	103,914	114,360	9,649	10,595
	Canada	840	907	81	261,928	324,328	20,994	25,835
	Chile	221	224	95	214,558	226,689	6,857	7,246
	Czech Republic	295	297	90	73,536	81,642	6,528	7,222
	Denmark	339	366	89	56,096	62,988	7,463	8,496
	Estonia	206	206	93	10,807	11,634	5,867	6,316
	Finland	311	313	91	54,126	59,653	8,829	9,789
	France	223	231	89	605,371	676,730	5,641	6,308
	Germany	228	233	93	692,226	742,416	4,990	5,355
	Greece	188	192	97	92,444	95,580	5,125	5,301
	Hungary	204	208	93	84,032	90,652	4,810	5,184
	Iceland	133	140	85	3,503	4,135	3,503	4,135
	Ireland	183	185	84	45,115	53,644	5,016	5,977
	Israel	172	186	90	91,181	101,288	6,061	6,727
	Italy	1,186	1,232	93	473,104	510,005	38,084	41,003
	Japan	191	200	96	1,034,803	1,076,786	6,351	6,609
	Korea	156	157	99	595,461	603,004	5,033	5,101
	Luxembourg	42	42	95	5,260	5,523	5,260	5,523
	Mexico	1,468	1,562	94	1,193,866	1,271,639	33,786	35,972
	Netherlands	177	199	85	148,432	174,697	4,434	5,215
	New Zealand	177	197	85	40,397	47,703	5,248	6,206
	Norway	197	208	91	51,155	56,286	4,686	5,156
	Poland	182	188	88	325,389	371,434	5,629	6,452
	Portugal	187	195	87	80,719	92,395	5,608	6,426
	Slovak Republic	231	236	94	50,544	53,912	5,737	6,106
	Slovenia	335	353	90	16,146	17,849	7,211	7,921
	Spain	902	904	90	334,382	372,042	26,443	29,027
	Sweden	209	211	92	87,359	94,784	4,739	5,141
	Switzerland	410	422	92	72,116	78,424	11,218	12,138
	Turkey	169	170	98	850,830	866,269	4,847	4,939
	United Kingdom	505	550	86	528,231	613,736	12,638	14,649
	United States	161	207	89	2,429,718	2,734,268	6,094	6,848
Partners	Albania	204	204	92	39,275	42,466	4,743	5,102
	Argentina	219	229	88	457,294	519,733	5,804	6,680
	Brazil	837	886	90	2,133,035	2,368,438	19,877	22,326
	Bulgaria	187	188	96	51,819	54,145	5,280	5,508
	Colombia	352	363	93	507,178	544,862	11,164	12,045
	Costa Rica	191	193	89	35,525	39,930	4,582	5,187
	Croatia	163	164	92	41,912	45,473	6,153	6,675
	Cyprus*	117	131	93	8,719	9,344	5,078	5,458
	Hong Kong-China	147	156	93	62,059	66,665	4,659	5,004
	Indonesia	206	210	95	2,478,961	2,605,254	5,579	5,885
	Jordan	233	233	95	105,493	111,098	7,038	7,402
	Kazakhstan	218	218	99	206,053	208,411	5,808	5,874
	Latvia	211	213	91	14,579	16,039	5,276	5,785
	Liechtenstein	12	12	93	293	314	293	314
	Lithuania	216	216	92	30,429	33,042	4,618	5,018
	Macao-China	45	45	99	5,335	5,366	5,335	5,366
	Malaysia	164	164	94	405,983	432,080	5,197	5,529
	Montenegro	51	51	94	7,233	7,714	4,799	5,117
	Peru	240	243	96	398,193	414,728	6,035	6,291
	Qatar	157	164	100	10,966	10,996	10,966	10,996
	Romania	178	178	98	137,860	140,915	5,074	5,188
	Russian Federation	227	227	97	1,141,317	1,172,539	6,418	6,602
	Serbia	152	160	93	60,366	64,658	4,681	5,017
	Shanghai-China	155	155	98	83,821	85,127	6,374	6,467
	Singapore	172	176	94	47,465	50,330	5,546	5,887
	Chinese Taipei	163	163	96	281,799	292,542	6,046	6,279
	Thailand	239	240	99	695,088	702,818	6,606	6,681
	Tunisia	152	153	90	108,342	119,917	4,391	4,857
	United Arab Emirates	453	460	95	38,228	40,384	11,460	12,148
	Uruguay	180	180	90	35,800	39,771	5,315	5,904
	Viet Nam	162	162	100	955,222	956,517	4,959	4,966

Source: OECD, PISA 2012 Database, Table A2.3.

*See notes at the beginning of this Annex.

StatLinkS <http://dx.doi.org/10.1787/888932935724>

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The OECD is a unique forum where governments work together to address the economic, social and environmental challenges of globalization. The OECD is also at the forefront of efforts to understand and to help governments respond to new developments and concerns, such as corporate governance, the information economy and the challenges of an aging population. The organization provides a setting where governments can compare policy experiences, seek answers to common problems, identify good practice and work to co-ordinate domestic and international policies.

The OECD member countries are: Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The European Commission takes part in the work of the OECD.

OECD Publishing disseminates widely the results of the organization's statistics gathering and research on economic, social and environmental issues, as well as the conventions, guidelines and standards agreed by its members.

How Your School Compares Internationally

OECD TEST FOR SCHOOLS (BASED ON PISA)

How prepared are 15-year-old students at your school to continue as lifelong learners, to find and fill jobs of the 21st century and compete and collaborate as citizens in a globalized economy?

The OECD Programme for International Student Assessment (PISA) has evaluated and compared education systems worldwide for more than ten years now, highlighting education systems that have either repeatedly outperformed others or have shown considerable improvement – sometimes within a relatively short period of time.

Increasingly, however, local educators and school staff are just as interested in international benchmarking and improvement as policy makers. The *OECD Test for Schools* (based on PISA) and the school results presented in this report allow local educators to do just that. The report presents performance results in reading, mathematics and science for schools that participated in the assessment, along with contextual information collected from students and school staff. Each school's results are presented in over 40 figures that are unique to each school. Along with performance results, the report attempts to show that the learning climate at school, as well as students' engagement toward learning, are important factors in trying to understand the overall performance of a school.

Because benchmarking is one step toward school improvement, the report also presents examples of relevant school policies and practices from around the world to stimulate reflection and discussions among local educators. The report also includes links that allow the reader one-click access to relevant OECD research, reports and resources.

Contents

Section 1. Introduction: Understanding Your School's Results

Section 2. What Students at Your School Know and Can Do in Reading, Mathematics and Science

Section 3. Student Engagement and the Learning Environment at Your School in an International Perspective

Section 4. Your School Compared with Similar Schools in Your Country

Section 5. Your School's Results in an International Context

Further Reading

PISA in Focus series (OECD, 2014, 2015)

Lessons from PISA 2012 for the United States, Strong Performers and Successful Reformers in Education (OECD, 2013)

PISA 2012 Results (Volumes I-VI) (OECD, 2013, 2014)

2016

For more information, contact the United States Test Service Provider
Northwest Evaluation Association™ (NWEA™)
NWEA.org | 866-654-3246
121 NW Everett Street, Portland, OR 97209

*Reports prepared in
partnership with NWEA*





AHS SCHOOL COMMITTEE

PISA DATA - DR. JANGER - 9.28.17

THE OECD PISA

- The PISA is a test administered by the Organisation for Economic Co-operation and Development (OECD).
- It is completed by 15-year old students in various countries, including the US, UK, and Singapore.
- Arlington High School performed exceptionally well in Reading, Math and Science in comparison with both local schools & global schools.
- Most notable is the percentage of students performing at the highest levels.



AHS PISA SCORES VS. AVERAGE U.S. SCORES

Figure G ■ Differences in student performance within your school and within other schools in the United States in PISA 2015

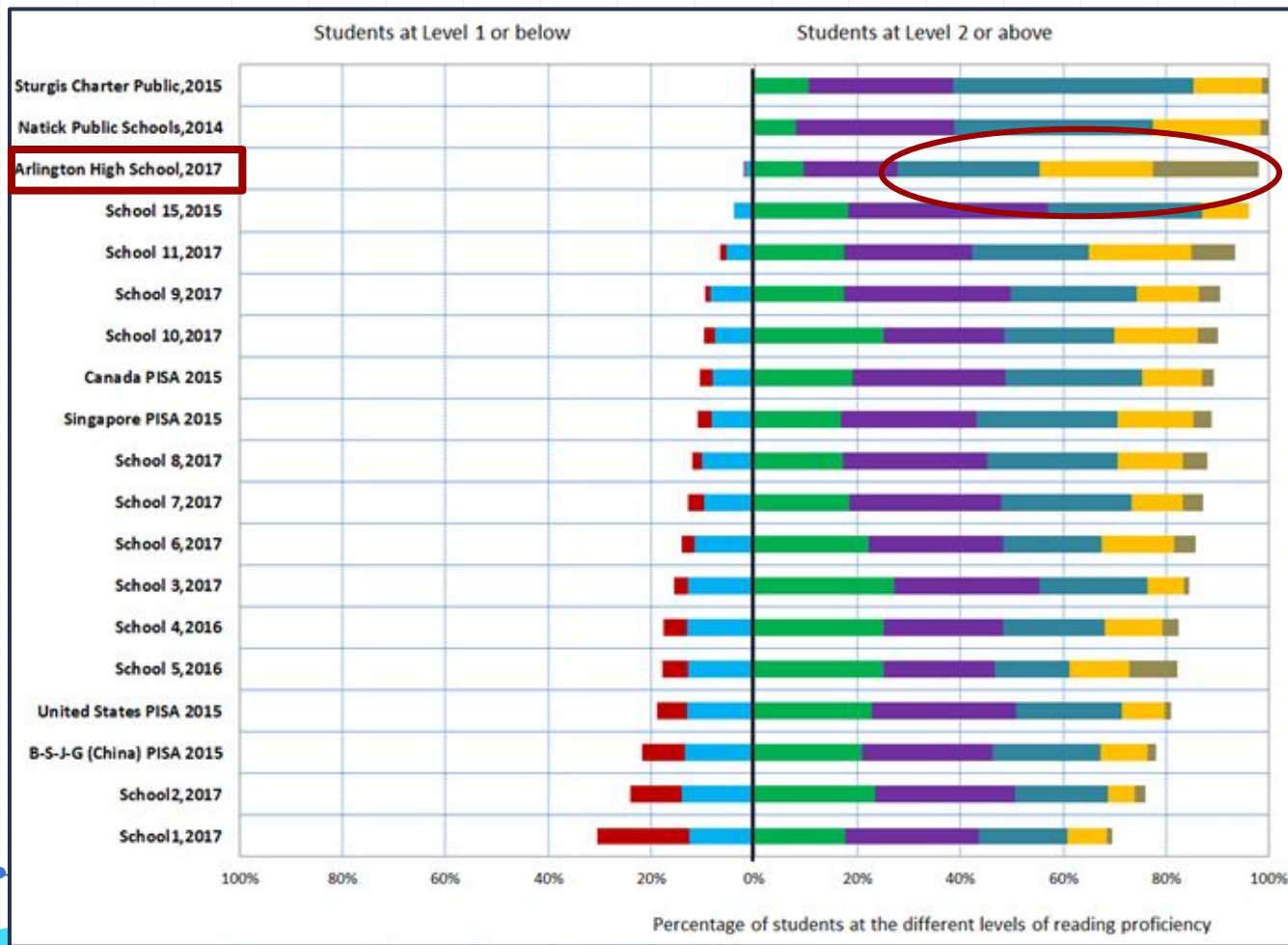
READING		YOUR SCHOOL		United States PISA 2015	
Student group	Score	S.E.	Mean score	S.E.	
Highest-performing quartile	620 (cut) ¹	N.A.	565	N.A.	
Lowest-performing quartile	531 (cut)	N.A.	448	N.A.	
MATHEMATICS		YOUR SCHOOL		United States PISA 2015	
Highest-performing quartile	672 (cut)	N.A.	529	N.A.	
Lowest-performing quartile	555 (cut)	N.A.	427	N.A.	
SCIENCE		YOUR SCHOOL		United States PISA 2015	
Highest-performing quartile	625 (cut)	N.A.	566	N.A.	
Lowest-performing quartile	543 (cut)	N.A.	443	N.A.	



READING

Distribution of Student Performance in Reading: Regional Schools vs. Selected PISA Countries and Economies

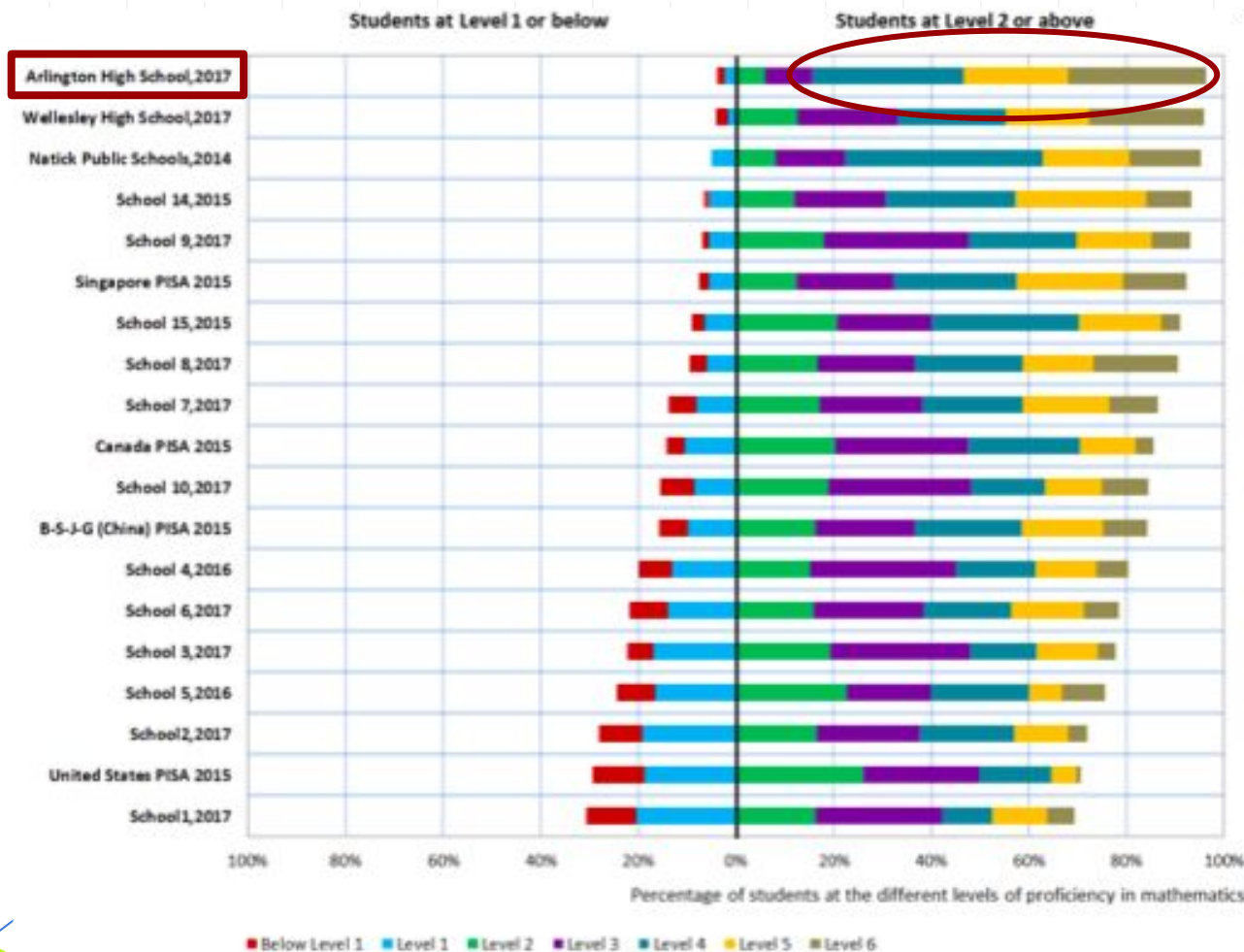
6 - Brown
5 - Yellow
4 - Blue
3 - Purple
2 - Green
1 - Light Blue
Below 1 - Red



MATH

Distribution of Student Performance in Reading: Regional Schools vs. Selected PISA Countries and Economies

6 - Brown
 5 - Yellow
 4 - Blue
 3 - Purple
 2 - Green
 1 - Light Blue
 Below 1 - Red



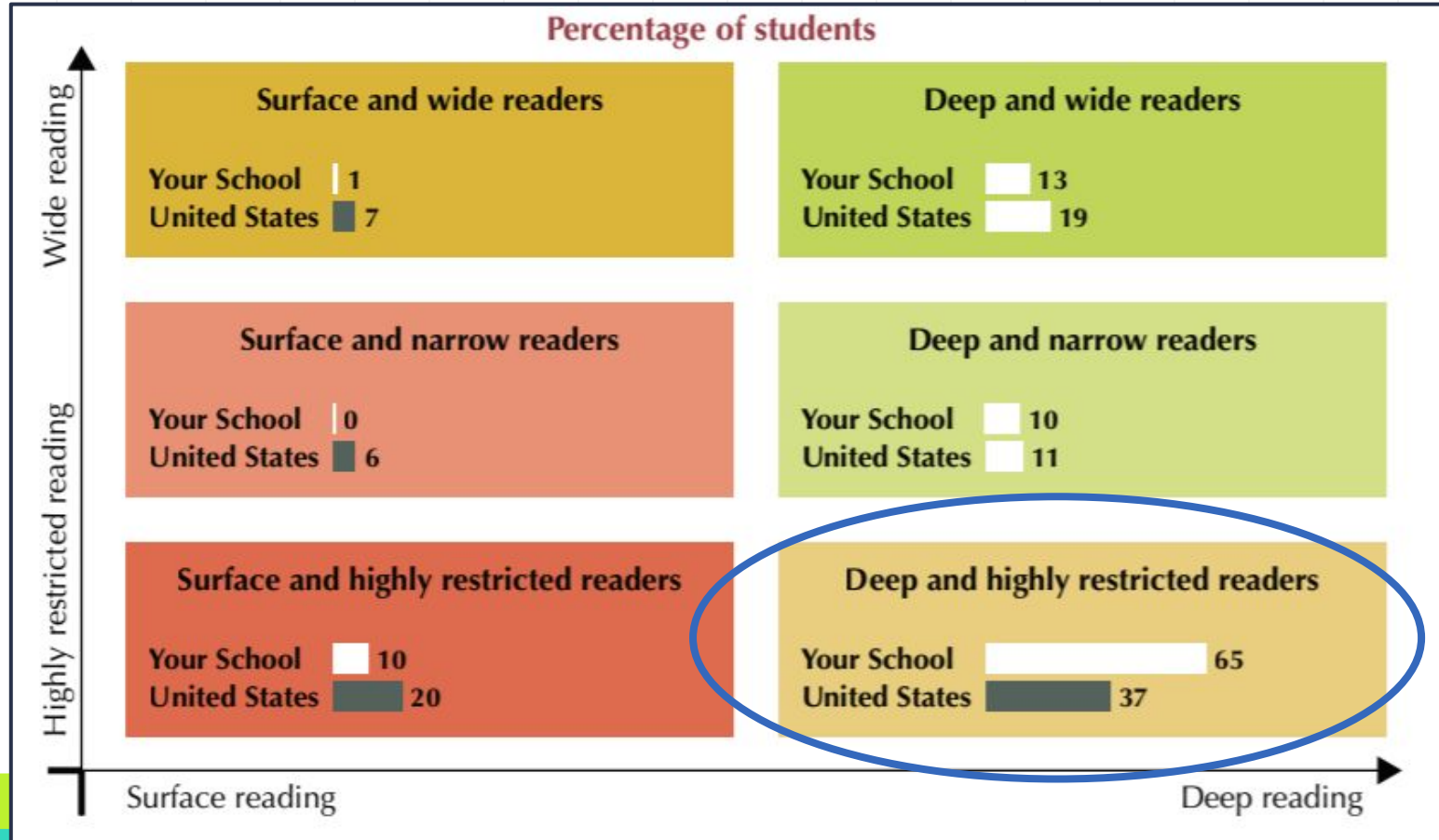
SCIENCE

Distribution of Student Performance in Reading: Regional Schools vs. Selected PISA Countries and Economies

6 - Brown
 5 - Yellow
 4 - Blue
 3 - Purple
 2 - Green
 1 - Light Blue
 Below 1 - Red

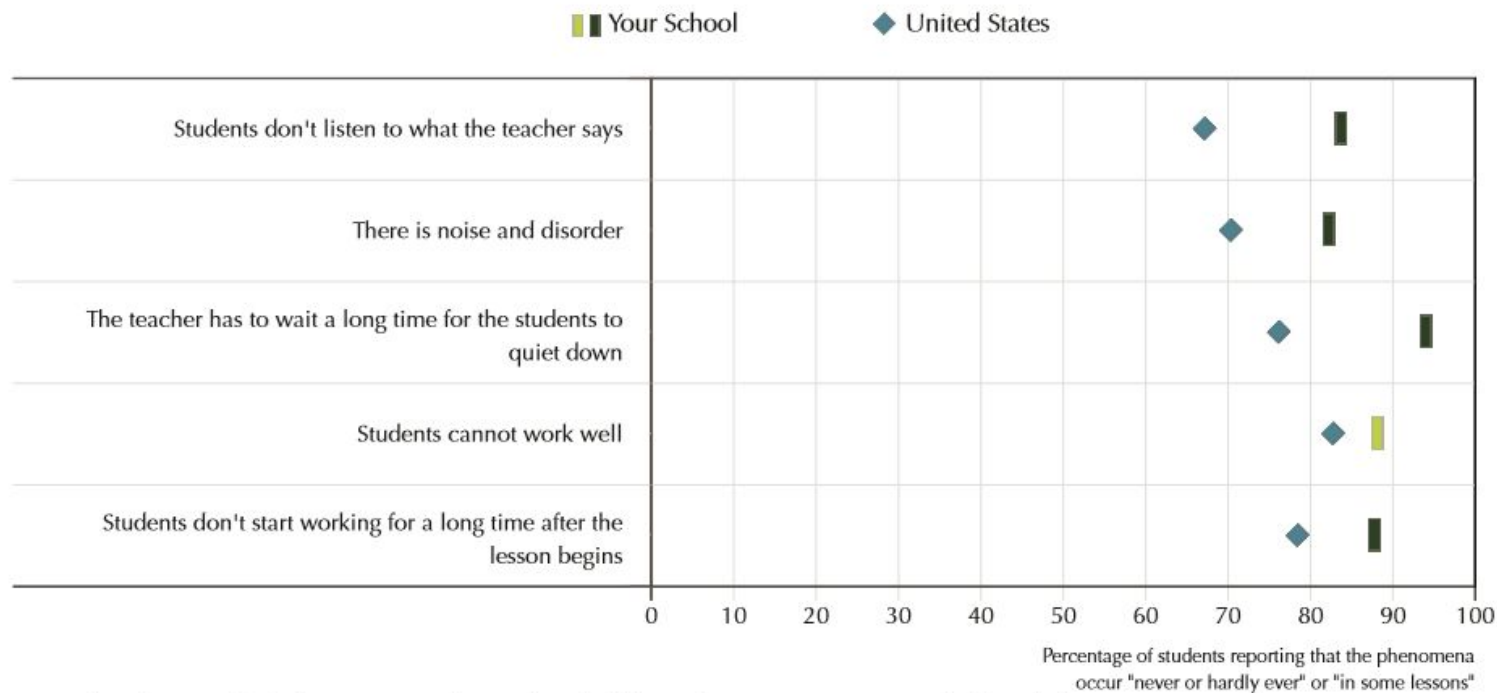


AHS Reader Profiles



AHS CLASSROOM DISCIPLINARY CLIMATE

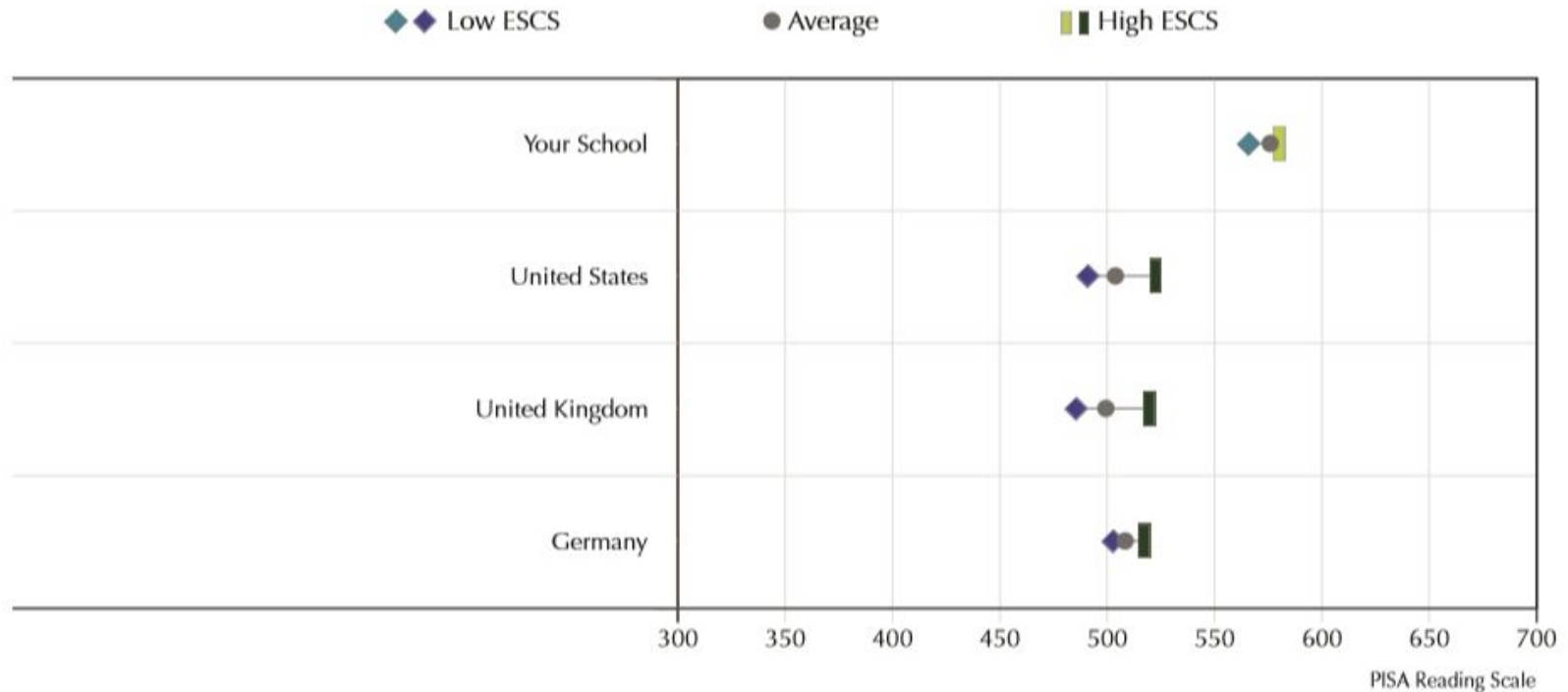
Figure D ■ **Classroom disciplinary climate in mathematics lessons at your school in the United States in PISA 2012**



Note: Values for your school that are statistically significantly different from your country are marked in a darker tone

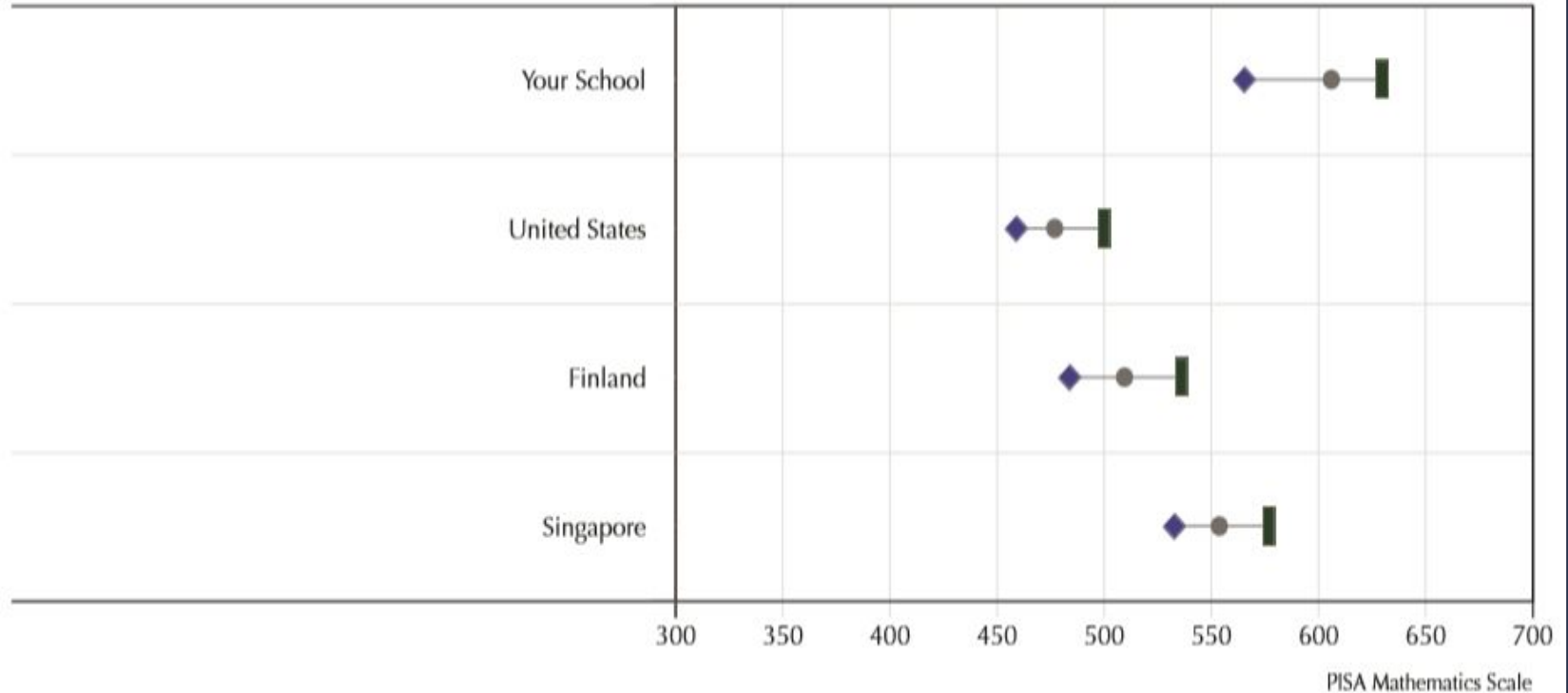
PERFORMANCE ACROSS SOCIO-ECONOMIC STATUS [READING]

Figure 5.3 ■ **Student performance within your school and within schools in selected countries and economies in reading, mathematics and science according to socio-economic status**



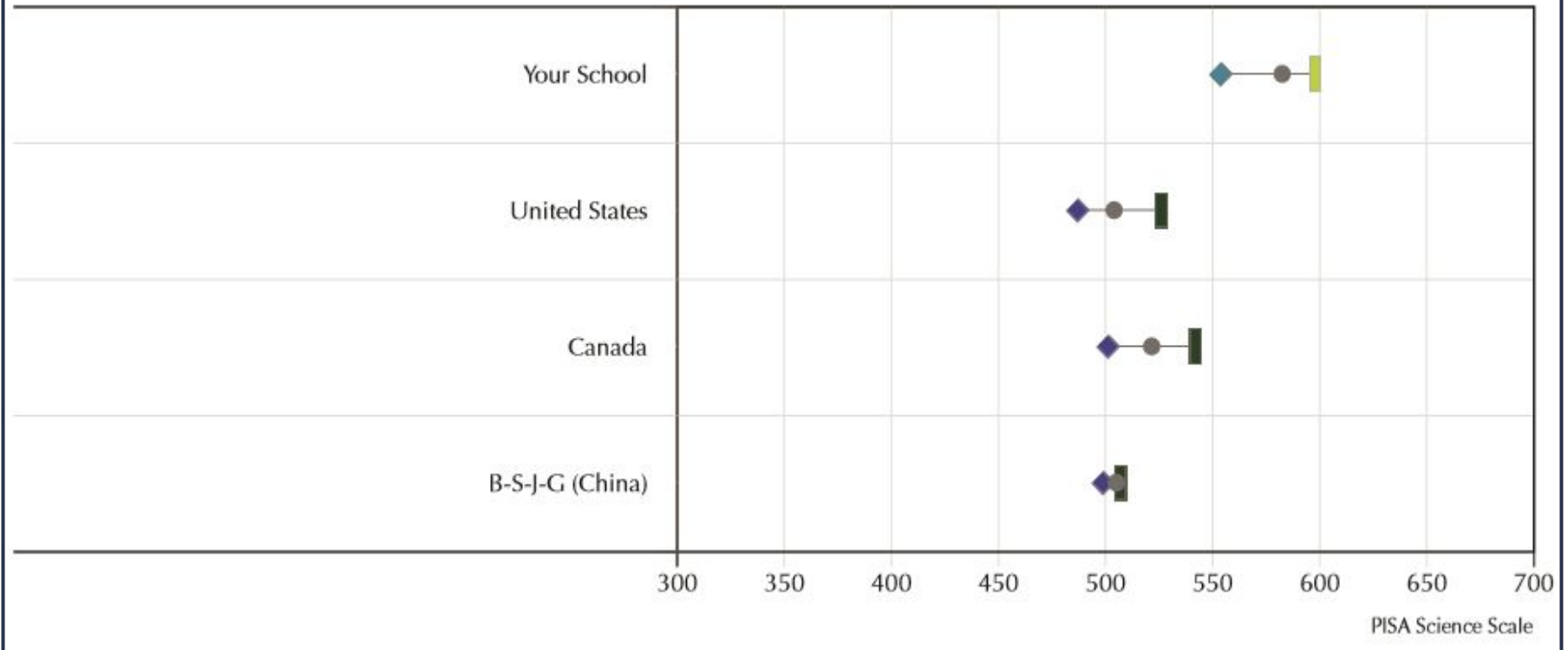
PERFORMANCE ACROSS SOCIO-ECONOMIC STATUS [MATH]

Figure 5.3 ■ **Student performance within your school and within schools in selected countries and economies in reading, mathematics and science according to socio-economic status**



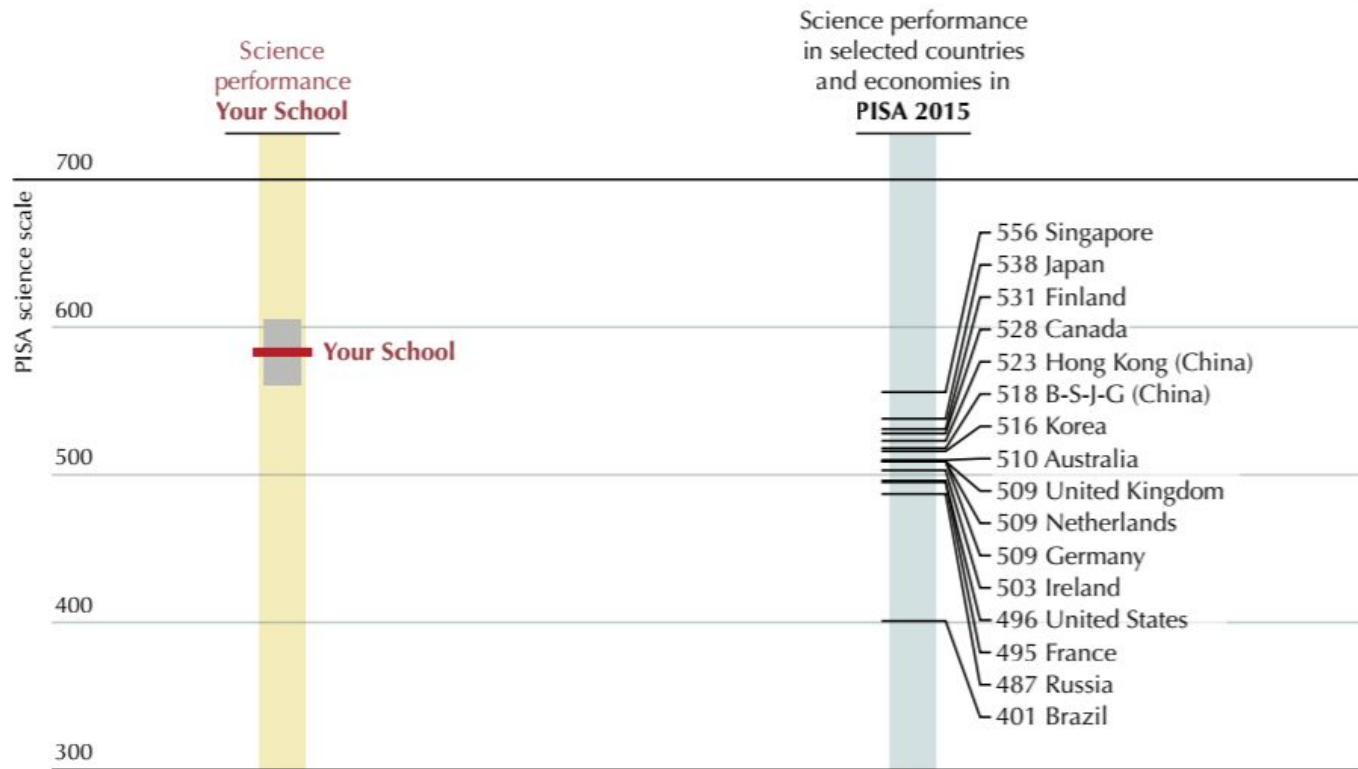
PERFORMANCE ACROSS SOCIO-ECONOMIC STATUS [SCIENCE]

Figure 5.3 ■ **Student performance within your school and within schools in selected countries and economies in reading, mathematics and science according to socio-economic status**



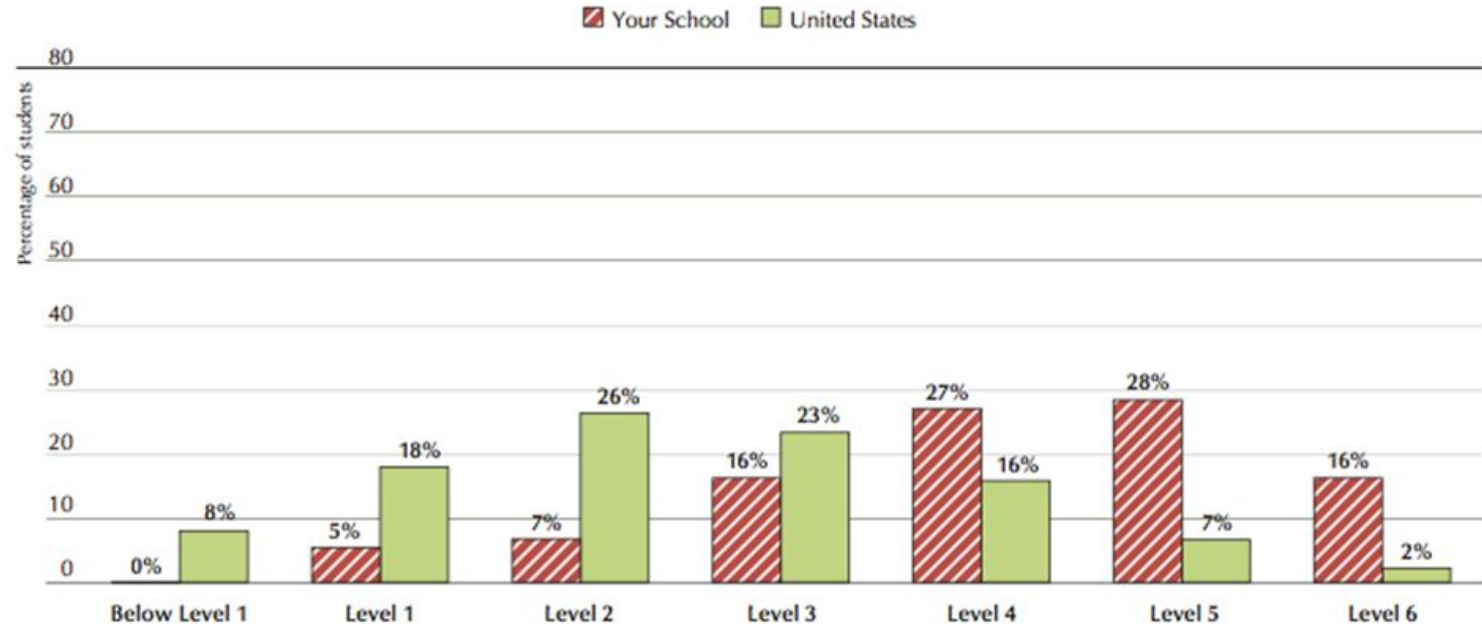
AHS SCIENCE PERFORMANCE

Figure 4.9 ■ How students at your school compare with selected countries and economies in science in PISA 2015



AHS MATHEMATICS PROFICIENCY

Figure 2.8 ■ **How proficient are students at your school in mathematics compared with students in the United States in PISA 2012**





Town of Arlington, Massachusetts

7:40 PM Youth Risk Behavior Survey and Social and Emotional Report, C. Bouvier, I. LaPlant

ATTACHMENTS:

Type	File Name	Description
▣ Report	Highlights_2017_(one_page_report).pdf	Highlights 2017 2017 Youth Risk Behavior Survey AHS
▣ Report	Arlington_YRBS_Report_Sept_2017.pdf	Arlington YRBS Sept 2017 Full Report
▣ Presentation	YRBS_-_school_committee_final.pptx	YRBS Updated presentaton

ARLINGTON HIGH SCHOOL
2017 Youth Risk Behavior Survey

Introduction

On April 4, 2017, the Arlington Public Schools administered the 2017 Middlesex League Youth Risk Behavior Survey (YRBS) to Arlington High School (AHS) students. This survey was managed and analyzed by John Snow, Inc (JSI) and funded by Lahey Health. In total, 906 AHS students completed the survey. The survey contained 130 questions and covered a broad range of health topics. Results of various topic areas reported by Arlington high school students are summarized below.

Reliability of survey responses

Often, students (and adults) will question the credibility of YRBS data, believing their peers provide false information on the survey. However, research has found that, because participation in the survey is voluntary and anonymous, students are predisposed to be truthful. In addition, there are internal checks in the survey to identify inconsistencies among individual student's responses. Over the years, YRBS data have been consistent with other survey data, as well as with national health outcomes. Likewise, YRBS findings are often consistent with community expectations of youth behavior patterns. For example, sexual activity and substance use are more prevalent among 12th graders than 9th graders.

Personal Safety & Violence

In the previous 30 days

- 12% of students report riding in a car with someone who had been drinking alcohol. (13% in 2016, 16% in 2013)
- 5% report driving a car or other vehicle when they had been drinking. (5% in 2016)

In the previous 12 months:

- 13% of students report having engaged in a physical fight. (12% in 2016, 15% in 2013)
- 12% report having property stolen or deliberately damaged by others during the school day. (9% in 2016, 11% in 2013)

Being bullied in the previous 12 months

- 12% of students report being bullied on school property. (13% in 2016, 13.5% in 2013)
- 10% report being bullied through electronic communication. (14% in 2016 and 2013)

Dating Violence

- 4% of students report having ever experienced sexual dating violence.
- 2% report having been physically assaulted by someone they dated. (5% in 2016 and 2013)

Social & Emotional Health

Stress and Mental Health

- 48% of students report feeling they are under too much stress "most of the time or always." (41% in 2016, 36% in 2013)
 - ~34% report school demands/expectations (such as assignments, homework, etc.) is the greatest source of stress
 - ~27% report their busy schedule is the greatest source of stress
- 25% of students report feeling sad or hopeless almost every day for two or more weeks in a row
- 17% are currently taking medicine or receiving treatment for behavioral health, mental health conditions, or emotional problems

Self-Harm

- 16% of students report hurting themselves on purpose (cuts, burns) in the past year. (19% in 2016, 17% in 2013)

Suicide

- 14% of students report having seriously considered attempting suicide within the past 12 months. (14% in 2016, 12% in 2013)
- 10% report having made a plan about how they would attempt suicide within the past 12 months. (13% in 2016, 11% in 2013)
- 3% report attempting suicide at least once within the past 12 months. (8% in 2016, 7% in 2013)

Substance Use

Tobacco Use

- 89% of students report having never tried a cigarette (not even a puff). (87% in 2016, 80% in 2013)
- 96% report having not smoked a cigarette during the previous 30 days. (92% in 2016, 93% in 2013)
- 79% report having never used an electronic cigarette, or vape device. (higher than the Middlesex League at 65%) (83% in 2016)
- 92% report having never used an e-cig during the previous 30 days. (higher than Middlesex League at 77%) (91% in 2016)

Alcohol Use

- 43% of students report having never had more than a sip of alcohol (other than for religious purposes). (42% in 2016, 47% in 2013)
- 72% report having not had a drink of alcohol during the previous 30 days. (64% in 2016, 70% in 2013)
- 84% report having not had 5 or more drinks in a row (within a couple hours) during the previous 30 days. (83% in 2016, 84% in 2013)

Marijuana Use

- 68% of students report having never used marijuana. (68% in 2016, 71% in 2013)
- 80% report having not used marijuana in the previous 30 days. (79% in 2016, 84% in 2013)

Misuse of Prescription Drugs

- 96% report having not used prescription drugs not prescribed to them in the previous 30 days. (93% in 2016, 90% in 2013)
- 96% report having never taken an over the counter drug (i.e. cough medicine) to get high. (93% in 2016 and 2013)

Other Drug Use

- 99% of students report having never used heroin. (97% in 2013 and 2016)
- 97% report having never used any form of cocaine. (97 % in 2016, 95% in 2013)
- 14% report having been offered, sold, or given an illegal drug on school property in the past 12 months. (13% in 2016, 15% in 2013)

Sexuality

- 20% of students report being gay/lesbian, bisexual, or uncertain about their sexuality. (13% in 2016)
- 24% report ever having sexual intercourse. (21% in 2016, 22% in 2013)
- 4% report having had 4 or more sexual partners in their lifetime.
- 38% report engaging in sexting in the past 12 months. (25% in 2016, 22% in 2013)

- 7% report having experienced sexual intercourse or sexual touching against their will. (13% in 2016 and 2016).

Physical Fitness & Nutrition

Nutrition

- 7% of students report having not eaten breakfast during the previous 7 days.
- 84% of students report having not eaten breakfast at least one day in the previous 7 days.
- 21% of students report having not drank milk in the previous 7 days.

Body Image

- 21% of students report describing themselves as slightly or very overweight.
- 35% of students report trying to lose weight. (lower than Middlesex League at 43%)

Physical Activity

- 54% of students report participating in a school-sponsored athletic team in the previous 12 months. (58% in 2016)
- 45% report spending 3 or more hours a day in front of a screen not related to school work (playing video games, computer games, or on the computer).

2017 Youth Risk Behavior Survey (YRBS)

Arlington Report



Acknowledgements

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Lahey Health

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Overview

The Youth Risk Behavior Surveillance System (YRBSS), established in 1990, was developed largely to monitor certain risky health behaviors and other priority areas among school-aged youth and young adults. In particular, it monitors behaviors related to the following areas: 1) unintentional injuries and violence; 2) mental health; 3) alcohol and other drugs; 4) tobacco; 5) sexual behaviors related to unintended pregnancy and sexually transmitted infections (STIs), including HIV infection; and 6) nutrition and physical activity. Through the Youth Risk Behavior Survey (YRBS), the YRBSS can determine the prevalence of health behaviors; assess whether health behaviors increase, decrease, or stay the same over time; examine the co-occurrence of health behaviors; provide comparison data for geographies and subpopulations; and monitor progress toward achieving Healthy People objectives and program indicators.

Nearly every state in the nation administers the YRBS through a cooperative agreement with the Division of Adolescent and School Health at the Centers for Disease Control and Prevention (CDC). As part of this agreement, the MA Department of Public Health draws data from a representative sample of cities and towns in the Commonwealth and develops a report of the risks facing the Commonwealth's youth. This effort is extremely valuable, but individual cities and towns are not required to conduct their own assessments and the Commonwealth's YRBS is not designed to provide information on the variation that exists across the Commonwealth.

Therefore, the Middlesex League, which includes the school districts of Arlington, Belmont, Burlington, Lexington, Melrose, Stoneham, Reading, Wakefield, Watertown, Wilmington, Winchester, and Woburn, decided to collaborate on the YRBS to provide comparative data that would allow individual school districts and the region overall to better understand and respond to the health risks facing youth in their communities, as well as to promote information sharing and coordination across the school districts, health officials, and other community-based service providers. Arlington's 2017 YRBS was conducted as part of this regional collaborative effort.

Between January and August 2017, superintendents and a number of health coordinators from the Middlesex League districts met three times to plan for and implement the 2017 YRBS. Ultimately, the League members agreed to develop a common YRBS instrument based on the core survey developed by the CDC and used by the Massachusetts Department of Public Health for the Commonwealth's YRBS. By using a common survey instrument, the individual districts can not only conduct their own individual district-level YRBS, but also they can combine their data to create a regional average that each district can use to facilitate comparative analysis. In addition to using a common survey instrument, the League members agreed to continue to explore how to share information and support each other in response to the data findings. Furthermore, the League members decided to conduct a collaborative YRBS every two years so that they could continue to leverage the power of the coalition and maintain a regional benchmark to compare and track themselves against throughout time.

Methods and Approach

District Involvement

Superintendents from the 12 school districts of the Middlesex League participated in introductory calls with John Snow, Inc. (JSI) to determine their participation in the collaborative survey effort this year. Five districts (Belmont, Lexington, Reading, Watertown, and Wilmington) already had plans to administer the survey but affirmed their commitment to be involved in the Middlesex League YRBS in upcoming years. Thus, for this reporting period, JSI worked with seven school districts (Arlington, Burlington, Melrose, Stoneham, Wakefield, Winchester, and Woburn) to administer the survey, collect and analyze data, and write reports of the findings. The Middlesex League region data includes the data of only these seven school districts. Over the next year, the school districts in the Middlesex League will work collaboratively to develop plans to ensure broader participation in the 2019 YRBS process.

Survey Development and Administration

Participating school districts provided JSI with examples of the surveys used in previous years of administrations. These surveys were compared to surveys of other districts and to the CDC version of the YRBS. From these sources, JSI developed a “master survey” that included all questions from the CDC version, as well as a small selection of additional questions drawn from district surveys. JSI proposed this survey to participating schools, leaving the option open that schools either remove selected questions or add items critical for the district to collect. Schools that were recipients of the Drug Free Communities (DFC) grant or the STOP Act grant were required to ask a series of questions about drug and alcohol use and perception. To simplify versions of the survey, all schools agreed to ask the DFC and STOP Act questions. All participating schools decided to adopt the JSI version of the survey and additions to or deletions from that content remained minor.

JSI designed the survey in SurveyGizmo with the appropriate customization of the instrument for each district. Once the survey was finalized, JSI worked with each district to develop a plan and schedule to administer the survey and supported districts with confidentiality practices, the student opt-out process, and privacy assurances. After survey administration, schools were asked to report the number of students who sat down to take the survey to allow JSI to cross check that number with completed survey records online.

Data Cleaning and Reporting of Results

Online administration of the survey allowed for results to be immediately transferred to JSI’s secure computer servers, where the data was aggregated together and analyzed following methods described in *Morbidity and Mortality Weekly Report (MMWR)* / March 1, 2013 / Vol. 62 / No. 1). Overall rate of completion was checked for each survey. Records with fewer than 30 valid responses for high schools and fewer than 25 responses for middle schools (shorter overall survey length) were removed. All data analyses were conducted using SAS 9.4 (SAS Institute Inc., Cary, NC). Summary reports were developed for each district, highlighting key findings in comparison to the Middlesex League region, Commonwealth, and national averages, whenever possible.

Key Findings

If one looks at the leading causes of illness and death among youth in the United States (e.g., motor vehicle crashes, unintentional injuries, homicide, suicide, sexually transmitted disease), as well as the chronic diseases and associated risk factors that impact adults (e.g., hypertension, diabetes, cardiovascular disease, cancer), it is clear that they are all related to six major health behaviors: 1) behaviors that contribute to unintentional injuries and violence; 2) behaviors related to mental health, 3) tobacco use; 4) alcohol and other drug use; 5) sexual behaviors related to unintended pregnancy and sexually transmitted infections (STIs), including HIV infection; and 6) unhealthy dietary behaviors and physical inactivity. These behaviors are frequently interrelated and, while their ultimate outcomes are often not presented until adulthood, the behaviors are established very early during childhood and adolescence.

The Youth Risk Behavior Survey (YRBS) was conducted in Arlington during the spring of 2017 to assess these behaviors among middle and high school students. The following is a brief review of key findings from the YRBS. The summary below is organized into six sections following the priority health behaviors identified above. In addition to the key findings from the survey, the relevance and implications of each priority health behavior are described.

Unintentional Injury and Violence

Unintentional injuries are accidental injuries where the outcome was not sought, such as injuries from motor vehicle crashes, falls, fires and burns, drowning, poisonings, and suffocation. According to the CDC, in the United States in 2014, 71% of all deaths among persons aged 10–24 years resulted from one of four causes: motor vehicle crashes (23%), other unintentional injuries (17%), homicide (14%), and suicide (17%).¹ Factors that may protect youth unintentional injuries include better home and traffic safety interventions. Youth violence is defined as violence either against or committed by a child or adolescent. Issues most associated with youth violence include physical fighting, bullying, cyber-violence, dating violence, and child abuse and neglect. Factors that may protect some youth from violence include connectedness to family or other adults, such as teachers or guidance counselors; ability to discuss problems with parents; perception that parental expectations for school performance are high; frequent shared activities with parents; youth involvement in social activities; commitment to school; and the consistent presence of a parent during at least one of the following: when awakening, when arriving home from school, during evening mealtimes, and when going to bed.

The 2017 Arlington High School YRBS asked questions related to driving safety, weapon carrying, physical fighting, bullying, cyber-violence, and dating violence. Compared to the Middlesex League region average and the Commonwealth and national averages (when comparable data was available), Arlington high school students fared considerably better than their counterparts. Across virtually all

¹ CDC. Underlying cause of death 1999–2014 on CDC WONDER online database, released 2015. Data are from the Multiple Cause of Death Files, 1999–2014, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program.

areas assessed in the survey, much lower percentages of Arlington high school students were either injured or victims of violence compared to students in the Middlesex League region and in the Commonwealth overall. Furthermore, lower percentages of students participated in the risky behaviors that often lead to injury or violence. While Arlington high school students do participate in risky behaviors and are injured or victims of violence to some degree, they occur less often compared to students overall in the Middlesex League region and in the Commonwealth.

The following are key findings from this section.

- Slightly more than 1 in 10 of Arlington high school students reported riding with a driver who had been drinking alcohol (12.3%) or driving while they had been using marijuana (11.9%); in the Middlesex League region, 14.0% of high school students reported riding with a driver who had been drinking alcohol and 15.7% of students reported driving while using marijuana. In the Commonwealth, 18.2% of students reported riding with a driver who had been drinking alcohol.
- Approximately 20% of Arlington high school students reported either talking on the phone (24.0%) or texting or emailing (18.2%) while driving, compared to 38.8% of high school students in the Middlesex League region who reported talking on the phone and 32.8.7% who reported texting or emailing while driving. Among high school students in the Commonwealth, 39.3% reported texting or emailing while driving.
- 11.8% of Arlington high school students reported being bullied on school property and 10.4% of Arlington high school students reported being bullied electronically. In the Middlesex League region, 12.4% of high school students reported being bullied on school property; Commonwealth-wide, this percentage was 15.6. Regarding electronic bullying, 12.1% of Middlesex League region students reported being electronically bullied, and 13.0% of students in the Commonwealth reported the same.
- Approximately half as many Arlington high school students reported carrying a weapon (6.8%) as students in the Commonwealth overall (12.6%). In the Middlesex League region, 7.8% of high school students reported carrying a weapon.
- A lower percentage of Arlington high school students reported being in a physical fight (13.2%) compared to students in the Middlesex League region (15.1%) and in the Commonwealth (19.2%).

Mental Health

According to the World Health Organization, mental disorders are the single most common cause of disability in young people. In the United States, approximately 15–20% of children and adolescents are suffering from some form of mental disorder. Furthermore, 70% of mental disorders onset prior to age 25, making the adolescent years a critical window in which mental health can be promoted and mental health problems can be addressed. If left untreated, mental disorders can impede all aspects of health, including emotional well-being and social development, leaving young people feeling socially isolated,

stigmatized, and unable to optimize their social, vocational, and interpersonal contributions to society. It can also lead to suicide, which was the second leading cause of death in 2014 for youth ages 10–24 in the United States. Addressing mental health problems early in life can lead to decreases in emotional and behavioral problems, functional impairment, and contact with law enforcement. It can also lead to improvements in social and behavioral adjustment, learning outcomes, and school performance.²

The 2017 Arlington High School YRBS asked questions related to depression, suicide, stress, and behavioral health treatment. Some of the most concerning findings throughout the survey were related to mental health issues. Arlington high school students were slightly more likely than students in the Middlesex League region to experience sadness, consider suicide, or actually do something to purposefully hurt themselves. Students were less likely, however, to actually attempt suicide compared to their counterparts in the region and Commonwealth. Compared to students in the Middlesex League region, Arlington high school students were more likely to be taking medicine or receiving treatment for behavioral health, mental health conditions, or emotional problems to address their underlying issues.

The following are key findings from this section.

- One in four of Arlington high school students (24.9%) reported that they felt sad or hopeless almost every day for two or more weeks in a row, which was comparable to the Middlesex League region (23.7%) and lower than the percentage of high school students Commonwealth-wide (27.4%).
- Approximately 1 in 6 of Arlington high school students (15.5%) reported that they did something to purposefully hurt themselves without wanting to die, which was higher than the average for high school students in the Middlesex League region (13.1%).
- With respect to suicide, 14.0% of Arlington high school students reported that they seriously considered attempting suicide and 9.7% said that they made a plan about how they would attempt suicide. This data is comparable, though slightly higher, to high school students in the Middlesex League region overall (12.2% and 8.9%, respectively). Commonwealth-wide, Arlington high school students were less likely to consider attempting suicide or have a suicide plan, with 17.7% of high school students in the Commonwealth reporting that they had seriously considered attempting suicide and 14.6% reporting that they made a plan about how they would attempt suicide.
- With respect to actual suicide attempts, 2.8% of Arlington high school students reported that they attempted suicide, which was slightly lower than the Middlesex League region (3.2%) and considerably lower than the Commonwealth (7.0%).

² Kutcher, S., & Venn, D. (2008). Why Youth Mental Health Is So Important. *The Medscape Journal of Medicine*, 10(12), 275.

- In Arlington, 16.6% of high school students reported that they are currently taking medicine or receiving treatment for behavioral health, mental health condition, or emotional problem, compared to 13.5% of high school students in the Middlesex League region.
- The leading causes of negative stress for Arlington high school students and students throughout the Middlesex League region were a “busy schedule” and “school demands/expectations.” A greater percentage of Arlington high school students reported “keeping up with schoolwork” as the most stressful aspect of school (36.4%) than students in the Middlesex League region (28.8%).

Tobacco

Tobacco use, and especially cigarette smoking, has become an epidemic in the United States. If smoking among youth in the United States continues at the current rate, 5.6 million of today’s children and youth under the age of 18 will die early from a smoking-related illness; this translates to 1 out of every 13 children or youth. Preventing tobacco use among youth is critical to ending the national epidemic. Nearly 9 out of 10 cigarette smokers first tried smoking by age 18, and 99% first tried smoking by age 26. Each day in the United States, more than 3,200 youth aged 18 years or younger smoke their first cigarette, and an additional 2,100 youth and young adults become daily cigarette smokers. In 2015, almost a fifth of middle schoolers and nearly half of high school students said they had ever tried a tobacco product.³

The 2017 Arlington High School YRBS asked questions related to cigarette use, smokeless tobacco, and electronic vapor products. Compared to the Middlesex League region averages and the Commonwealth and national averages (when comparable data was available), once again Arlington high school students fared considerably better than their counterparts across virtually all areas assessed. Arlington high school students are considerably less likely to use tobacco products or electronic vapor products than high school students in the Middlesex League region and the Commonwealth. The only exception is that high school students in Arlington were slightly more likely to report that they tried cigarette smoking before 13 years old than high school students in the Middlesex League region.

The following are key findings from this section.

- Among Arlington high school students, 11.6% reported that they had ever tried cigarette smoking, 4.3% reported being current smokers, and 0.8% said they smoke cigarettes frequently. These figures are slightly less than the Middlesex League region and approximately half the rates that were reported by high school students in the Commonwealth.
- With respect to early adopters of cigarette smoking, Arlington high school students were slightly more likely to have reported trying cigarettes before the age of 13 (3.4%), compared to 3.0% for high school students in the Middlesex League region.

³ Smoking & Tobacco Use. (June, 2017).

https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm

- Substantially fewer high school students in Arlington reported currently using electronic vapor products (8.3%) compared to 23.4% for high school students in the Middlesex League region and 23.7% for high school students in the Commonwealth.

Alcohol and Drugs

Youth alcohol consumption is a major public health concern, as it is the most widely used substance of abuse among American youth. Approximately 15% of teens have had at least one drink of alcohol by age 15, and about 60% have had at least one drink by age 18. Moreover, while youth tend to drink less often than adults do, when they do drink they drink more; young people consume more than 90% of their alcohol by binge drinking. Underage drinking poses a range of risks, for both the individual and for society in general. It can lead to injury, death, impaired judgment, increased risk of physical and sexual assault, altered brain development, and a higher chance of alcohol dependence later in life.⁴

In addition to alcohol, illicit drug use is a concern for youth health. This can include both the abuse of illegal drugs and the misuse of prescription medications or other substances. Marijuana is the most commonly used illicit drug by both teenagers and adults in the United States. It can increase the risk for accidents and injuries, including impaired driving, and is associated with poorer school performance, reduced life satisfaction, and use of other drugs.⁵ Other drugs also pose a public health concern for youth. Prescription drug misuse has become a growing problem for teenagers, as it can lead to addiction and overdose deaths. Cocaine, heroin, and cough and cold medicine, among other drugs, all affect the body and mind and are dangerous for children and adolescents.⁶

The 2017 Arlington High School YRBS asked questions related to alcohol use, marijuana use, other illicit drug use, and prescription drug use. With respect to alcohol and drug use, the percentages for alcohol and drug use for Arlington high school students are consistently less than the percentages for high school students in the Middlesex League region and in the Commonwealth. This pattern persists for almost all questions in this section of the survey, whether it be related to alcohol, marijuana, cocaine, heroin, methamphetamines, ecstasy, or synthetic marijuana. The only exceptions are regarding early-adopters of alcohol (ever drank prior to age 13), drinking on school property, and whether students were offered, sold, or given an illegal drug on school property. In these cases, Arlington's percentages for high school students were comparable but slightly higher than the Middlesex League region but still considerably less than the Commonwealth average.

The following are key findings from this section.

⁴ National Institute on Alcohol Abuse and Alcoholism (February, 2017). *Underage Drinking*. Retrieved from https://pubs.niaaa.nih.gov/publications/underagedrinking/Underage_Fact.pdf

⁵ National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services (July, 2017). *Marijuana*. Retrieved from <https://teens.drugabuse.gov/drug-facts/marijuana>

⁶ National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services (July, 2017). *Drug Facts*. Retrieved from <https://teens.drugabuse.gov/drug-facts>

- Among Arlington high school students, 57.1% reported that they have ever drank alcohol, 27.9% reported that they currently drank alcohol (one or more times in the last month), and 16.0% reported that they “binge drank,” (drinking 4 or more drinks in a row for females of 5 or more drinks in a row for males).
- With respect to marijuana, 32.2% of Arlington high school students reported that they have used marijuana and 20.4% reported that they were current users of marijuana (one or more times in the last month).
- With respect to all other illicit drugs (i.e., cocaine, heroin, methamphetamines, ecstasy, and synthetic marijuana) the percentage of Arlington high school students who ever used each drug are low and range from 1.4% (inhalants) to 2.7% (cocaine). As stated above, these percentages are comparable to the Middlesex League region and considerably less than the percentages for the Commonwealth overall.
- Among Arlington high school students, 13.5% of students were offered, sold, or given an illegal drug on school property, compared to 11.3% of high school students in the Middlesex League region and 20.3% of students in the Commonwealth overall.

Sexual Behavior and HIV/AIDS

Youth who engage in sexual behaviors are at risk for unintended health outcomes. Sexual risk behaviors can put teens at risk for HIV infection, other sexually transmitted diseases (STDs), and unintended pregnancy. According to CDC data, lesbian, gay, and bisexual high school students in particular are at substantial risk for serious health outcomes. In 2015, young people aged 13–24 accounted for an estimated 22% of all new HIV diagnoses in the United States, and among young people aged 13–24 diagnosed with HIV in 2015, 81% were gay and bisexual males. Schools and other youth-serving organizations have a role to play in helping young people adopt attitudes and behaviors that support their health and well-being and reduce their risk of HIV, other STDs, and unintended pregnancy. According to the CDC, awareness and education are key aspects that should be incorporated into all educational environments.⁷

The 2017 Arlington High School YRBS asked questions related to sexual intercourse, sexting, pregnancy and disease prevention, and sexual transmitted diseases. The percentages of Arlington High School students who reported that they ever had sexual intercourse or who were currently sexually active were comparable to the percentages for high school students across the Middlesex League region but lower than the percentages for high school students Commonwealth-wide. This pattern persists for almost every question in this section of the survey. With respect to education and testing, Arlington high school students were slightly less likely to be tested for HIV or other sexually transmitted diseases but considerably more likely to have received education regarding sexual activity and sexually transmitted diseases than high school students in the Middlesex League region.

⁷ Centers for Disease Control and Prevention (March, 2017). *Sexual Risk Behaviors: HIV, STD, & Teen Pregnancy Prevention*. Retrieved from <https://www.cdc.gov/healthyyouth/sexualbehaviors/>

The following are key findings from this section.

- Among Arlington high school students, 23.8% reported that they had ever had sexual intercourse and 17.2% reported that they were currently sexually active.
- Among Arlington high school students who were sexually active, 19.9% reported that they drank alcohol or used drugs before their last sexual intercourse and 30% reported that they did not use a condom. These percentages were slightly lower than those of the Middlesex League region (20.8% and 30.0%, respectively).
- With respect to sexual messages, 37.7% of Arlington high school students reported that they had ever sent or received sexual messages or nude or semi-nude pictures or videos electronically. These percentages are comparable to the rates for the Middlesex League region.
- Among Arlington high school students, 52.5% reported receiving education related to condom use, 81.6% reported receiving education related to HIV/AIDS, and 81.4% reported receiving information about birth control methods. These percentages, especially regarding education about birth control methods, were considerably higher than what was reported for the Middlesex League region overall (44.2%, 73.0%, and 61.0% respectively).
- With respect to testing for HIV and other sexually transmitted diseases, Arlington high school students were less likely to get tested (5.4% for HIV and 7.5% for other sexually transmitted diseases) than their counterparts in the Middlesex League region (6.7% and 8.2%, respectively).

Nutrition and Physical Activity

Healthy eating and regular physical activity are essential for the physical and mental health of youth. Healthy eating is important for helping individuals maintain a healthy body weight and consume necessary nutrients. Both healthy eating and regular physical activity can help reduce the risk of developing health conditions including high blood pressure, heart disease, cancer, and diabetes. Furthermore, physical activity can help children and adolescents improve cardiorespiratory fitness, build strong bones and muscles, control weight and reduce symptoms of anxiety and depression. Higher physical activity levels are associated with improved cognitive performance, and students who are physically active tend to do better in school. Similarly, eating a healthy breakfast is associated with improved cognitive function, reduced absenteeism, and improved mood. It is recommended that people aged 2 years or older maintain a healthy diet that includes a variety of fruits and vegetables, whole grains, fat-free and low-fat dairy products, a variety of protein foods, and oils. Additionally, the U.S. Department of Health and Human Services recommends that children and adolescents aged 6 to 17 years should have 60 minutes or more of physical activity each day.^{8,9}

⁸ Centers for Disease Control and Prevention (June, 2017). *Physical Activity Facts*. Retrieved from <https://www.cdc.gov/healthyschools/physicalactivity/facts.htm>

⁹ Centers for Disease Control and Prevention (May, 2017). *Childhood Nutrition Facts*. Retrieved from <https://www.cdc.gov/healthyschools/nutrition/facts.htm>

The 2017 Arlington High School YRBS asked questions related to nutrition, physical activity, and overweight and obesity. Similar to other sections of this report, Arlington high school students fared better than high school students in the Middlesex League region and the Commonwealth on nearly all of the questions in this section. Arlington high school students are more likely to eat fruits and vegetables, to eat breakfast, and to be physically active than their counterparts in the Middlesex League region and the Commonwealth. They are also less likely to be obese or overweight than their counterparts.

The following are key findings from this section.

- Among Arlington high school students, only 2.8% of students did not eat fruit or drink 100% fruit juice in the 7 days before survey, compared to 4.0% of high school students in the Middlesex League region and 5.5% of high school students in the Commonwealth. Similarly, only 2.2% of students did not eat vegetables in 7 days before the survey, compared to 4.2% of students in the Middlesex League region and 6.0% of students in the Commonwealth.
- A smaller percentage of Arlington high school students reported not drinking milk (20.7%) and drinking soda (51.9%) in the 7 days before the survey than students in the Middlesex League region overall (24.8% and 57.3%, respectively).
- With respect to overweight and obesity, only 4.8% of Arlington high school students were obese and 9.9% were overweight, compared to 8.2% and 13.2% respectively for the Middlesex League region, and 11.0% and 15.3% respectively for the Commonwealth overall. A greater percentage of Arlington high school students were not trying to lose weight (64.7% for Arlington, 57.6% for the Middlesex League region, and 54% for the Commonwealth).

Appendix A: Data Tables

Table 1: Arlington's High School Responses with Comparisons to Middlesex League, Commonwealth, and Nation

	Arlington		Middlesex League		MA*	U.S.*
	n	%	n	%	%	%
UNINTENTIONAL INJURY AND VIOLENCE						
Rode with a driver who had been drinking alcohol (in a car or other vehicle one or more times during the 30 days before the survey)	114	12.3	808	14.0	18.2	20.0
Drove when they had been drinking alcohol (in a car or other vehicle one or more times during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	18	4.7	186	6.3	9.4	7.8
Drove when they had been using marijuana (in a car or other vehicle one or more times during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	45	11.9	458	15.7	-	-
Talked on a cell phone while driving a car or other vehicle (on at least 1 day during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	88	24.0	1115	38.8	-	-
Texted or e-mailed while driving a car or other vehicle (on at least 1 day during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	68	18.2	946	32.8	39.3	41.5
Carried a weapon (such as, a gun, knife, or club, on at least 1 day during the 30 days before the survey)	63	6.8	446	7.8	12.6	16.2
Carried a weapon on school property (such as, a gun, knife, or club, on at least 1 day during the 30 days before the survey)	20	2.2	127	2.2	3.2	4.1
Carried a gun (1 or more times during the 12 months before the survey)	14	1.5	115	2.0	-	-
Were threatened or injured with a weapon on school property (such as, a gun, knife, or club, 1 or more times during the 12 months before the survey)	25	2.7	224	3.9	4.1	6.0
Were in a physical fight (one or more times during the 12 months before the survey)	122	13.2	869	15.1	19.2	22.6
Were in a physical fight on school property (one or more times during the 12 months before the survey)	34	3.7	262	4.6	5.6	7.8

*Massachusetts and United States comparison data are from the 2015 CDC YRBS.

Were a member of a gang (during the 12 months before the survey)	51	5.5	301	5.2	-	-
Did not go to school because they felt unsafe at school or on their way to or from school (on at least 1 day during the 30 days before the survey)	32	3.5	254	4.4	4.8	5.6
Were electronically bullied (counting being bullied through e-mail, chat rooms, instant messaging, Web sites, or texting during the 12 months before the survey)	97	10.4	699	12.1	13.0	15.5
Were bullied on school property (during the 12 months before the survey)	109	11.8	717	12.4	15.6	20.2
Were ever physically forced to have sexual intercourse (when they did not want to)	37	4.0	263	4.6	5.5	6.7
Experienced physical dating violence (counting being hit, slammed into something, or injured with an object or weapon on purpose by someone they were dating or going out with 1 or more times during the 12 months before the survey, among students who dated or went out with someone during the 12 months before the survey)	18	2.0	160	2.8	-	-
Experienced sexual violence (counting kissing, touching, or being physically forced to have sexual intercourse when they did not want to 1 or more times during the 12 months before the survey)	60	6.5	439	7.6	-	-
Experienced sexual dating violence (counting kissing, touching, or being physically forced to have sexual intercourse when they did not want to by someone they were dating or going out with 1 or more times during the 12 months before the survey, among students who dated or went out with someone during the 12 months before the survey)	39	4.2	251	4.4	-	-
MENTAL HEALTH						
Felt sad or hopeless (almost every day for 2 or more weeks in a row so that they stopped doing some usual activities during the 12 months before the survey)	230	24.9	1359	23.7	27.4	29.9
Did something to purposefully hurt themselves without wanting to die (such as cutting or burning themselves on purpose, 1 or more times during the 12 months before the survey)	143	15.5	757	13.1	-	-
Seriously considered attempting suicide (during the 12 months before the survey)	128	14.0	697	12.2	14.9	17.7
Made a plan about how they would attempt suicide (during the 12 months before the survey)	89	9.7	510	8.9	11.9	14.6

Attempted suicide (one or more times during the 12 months before the survey)	26	2.8	180	3.2	7.0	8.6
Attempted suicide that resulted in an injury, poisoning, or overdose that had to be treated by a doctor or nurse (during the 12 months before the survey)	8	0.9	54	0.9	2.8	2.8
Are currently taking medicine or receiving treatment for behavioral health, mental health condition, or emotional problem (from a doctor or other health professional)	152	16.6	775	13.5	-	-
Which of the following do you find causes the most negative stress for you?						
Busy schedule (school, activities, sports, etc.)	243	27.1	1547	27.9		
Parent/family demands/expectations about academics, grades, etc.	87	9.7	595	10.7		
Difficulty getting enough sleep	37	4.1	288	5.2		
Extracurricular activity demands or pressures	18	2.0	110	2.0	-	-
School demands/expectations—such as assignments, homework, etc.	304	33.9	1685	30.4		
Social pressures from friends, peers, etc.	24	2.7	164	3.0		
Other family or personal issues which cause emotional stress for you	63	7.0	478	8.6		
Worrying about the future such as college, career, etc.	121	13.5	669	12.1		
Which of the following do you find the most stressful about school?						
Having to study things you do not understand	143	15.9	871	15.7		
Teachers expecting too much from you	110	12.2	813	14.7		
Keeping up with schoolwork	327	36.4	1594	28.8		
Having to concentrate too long during the school day	51	5.7	341	6.2	-	-
Having to study things you are not interested in	98	10.9	706	12.8		
Pressure of study	70	7.8	356	6.4		
Getting up early in the morning to go to school	65	7.2	570	10.3		
Going to school	35	3.9	285	5.1		
TOBACCO						
Ever tried cigarette smoking (even one or two puffs)	107	11.6	831	14.5	27.8	32.3
Tried cigarette smoking before age 13 years (even one or two puffs, for the first time)	31	3.4	171	3.0	-	-
Currently smoked cigarettes (on at least 1 day during the 30 days before the survey)	39	4.3	382	6.7	7.7	10.8
Currently smoked cigarettes frequently (on 20 or more days during the 30 days before the survey)	7	0.8	77	1.3	2.3	3.4

Ever used electronic vapor products (including e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens)	199	21.6	1996	34.9	44.8	44.9
Currently used electronic vapor products (including e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens on at least 1 day during the 30 days before the survey)	77	8.3	1337	23.4	23.7	24.1
Currently used smokeless tobacco (chewing tobacco, snuff, or dip on at least 1 day during the 30 days before the survey)	15	1.6	184	3.2	5.5	7.3
Currently smoked cigars (cigars, cigarillos, or little cigars on at least 1 day during the 30 days before the survey)	27	2.9	377	6.6	10.4	10.3
ALCOHOL AND DRUGS						
Ever drank alcohol (at least one drink of alcohol on at least 1 day during their life)	521	57.1	3234	57.8	61.3	63.2
Drank alcohol before age 13 years (for the first time other than a few sips)	74	8.0	414	7.4	12.9	17.2
Currently drank alcohol (at least one drink of alcohol on at least 1 day during the 30 days before the survey)	255	27.9	1858	32.8	33.9	32.8
Currently drank alcohol on school property (at least 1 drink of alcohol on school property on at least 1 day during the 30 days before the survey)	30	3.3	156	2.8	-	-
Drank 4 or more (for females) or 5 or more (for males) drinks of alcohol in a row (on at least 1 day during the 30 days before the survey)	147	16.0	1149	20.2	-	-
Ever used marijuana (one or more times during their life)	295	32.2	1985	35.1	40.9	38.6
Tried marijuana before age 13 years (for the first time)	20	2.2	183	3.2	6.3	7.5
Currently used marijuana (one or more times during the 30 days before the survey)	188	20.4	1286	22.7	24.5	21.7
Currently used marijuana or hashish (during the past 30 days)	189	20.6	1312	23.2	-	-
Currently used marijuana on school property (one or more times on school property during the 30 days before the survey)	31	3.4	243	4.3	-	-
Ever used cocaine (any form of cocaine, such as powder, crack, or freebase, one or more times during their life)	25	2.7	198	3.5	4.5	5.2

Ever used heroin (also called "smack," "junk," or "China white," one or more times during their life)	14	1.5	92	1.6	1.7	2.1
Ever used methamphetamines (also called "speed," "crystal," "crank," or "ice," one or more times during their life)	16	1.7	105	1.9	2.1	3.0
Ever used ecstasy (also called "MDMA," one or more times during their life)	21	2.3	158	2.8	4.3	5.0
Ever used synthetic marijuana (also called "K2", "Spice", "fake weed", "King Kong", "Yucatan Fire", "Skunk", or "Moon Rocks", one or more times during their life)	20	2.2	240	4.3	7.9	9.2
Ever taken over-the-counter medication to get high (including cough syrup, at least one time during their life)	39	4.3	322	5.7	-	-
Sniffed glue, breathed the contents of aerosol spraycans, or inhaled paints or sprays to get high (during the past 30 days)	13	1.4	148	2.6	-	-
Used prescription drugs not prescribed to them (during the past 30 days)	41	4.5	377	6.7	-	-
Were offered, sold, or given an illegal drug on school property (during the 12 months before the survey)	124	13.5	639	11.3	20.3	21.7
SEXUAL BEHAVIOR AND HIV/AIDS						
Ever had sexual intercourse	215	23.8	1545	28.0	36.4	41.2
Were currently sexually active (had sexual intercourse with at least one person during the 3 months before the survey)	156	17.2	1157	20.8	27.7	30.1
Had sexual intercourse before age 13 years (for the first time)	12	1.3	98	1.8	2.9	3.9
Had sexual intercourse with four or more persons (during their life)	40	4.4	330	5.9	7.9	11.5
During your life, with whom have you had sexual contact? I have never had sexual contact	578	63.7	3104	57.6	-	-
Females	161	17.7	1093	20.3		
Males	136	15.0	1018	18.9		
Females and males	33	3.6	171	3.2		
Drank alcohol or used drugs before last sexual intercourse (among students who were currently sexually active)	46	19.9	338	20.8	21.8	20.6
Have been pregnant or gotten someone pregnant (at least one time)	12	1.3	118	2.1	-	-

Did not use a condom (during last sexual intercourse, among students who were currently sexually active)	63	30.0	529	34.4	37.5	43.1
Did not use any method to prevent pregnancy (during last sexual intercourse, among students who were currently sexually active)	15	7.3	122	8.1	8.6	13.8
Ever sent or received sexual messages or nude or semi-nude pictures or videos electronically	342	37.7	2395	42.7	-	-
Ever been tested for HIV (not counting tests done if donated blood)	49	5.4	370	6.7	-	-
Ever been tested for sexually transmitted diseases (STDs) (such as genital herpes, chlamydia, syphilis, or genital warts)	68	7.5	455	8.2	-	-
Ever been taught in school about AIDS or HIV infection	734	81.6	4054	73.0	-	-
Ever been taught in school about how to use condoms	472	52.5	2456	44.2	-	-
Ever been taught in school about birth control methods	732	81.4	3388	61.0	-	-
Talked with family members about sexual health (talked with parents or other adults in their family about sexuality or ways to prevent HIV infection, other sexually transmitted diseases (STDs), or pregnancy at least once during the 12 months before the survey)	445	49.4	2292	41.3	-	-
Have an adult in their school who can help them find sexual health services (such as HIV, STD and pregnancy testing, access to birth control, or support around their sexuality)	411	45.8	2230	40.3	-	-
Feel comfortable asking an adult at their school if they needed help finding sexual health services	217	24.2	1405	25.3	-	-
NUTRITION AND PHYSICAL ACTIVITY						
Did not eat fruit or drink 100% fruit juices (during the 7 days before the survey)	25	2.8	224	4.0	5.5	5.2
Did not eat vegetables (green salad, potatoes (excluding French fries, fried potatoes, or potato chips), carrots, or other vegetables, during the 7 days before the survey)	20	2.2	232	4.2	6.0	6.7
Did not drink milk (during the 7 days before the survey)	188	20.7	1378	24.8	21.0	21.5
Drank a can, bottle, or glass of soda or pop (not counting diet soda or diet pop, during the 7 days before the survey)	471	51.9	3186	57.3	67.4	73.8
Did not eat breakfast at all during the week (during the 7 days before the survey)	62	6.8	629	11.3	13.7	13.8

Did not eat breakfast on at least one day during the week (during the 7 days before the survey)	383	83.8	2681	86.0	65.1	63.7
Were not physically active at least 60 minutes per day at all during the week (doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time during the 7 days before the survey)	83	9.2	584	10.5	15.1	14.3
Were not physically active at least 60 minutes per day on 5 or more days during the week (doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time during the 7 days before the survey)	672	74.4	3928	70.6	54.8	51.4
Played video or computer games or used a computer 3 or more hours per day (for something that was not school work on an average school day)	406	44.7	2585	46.3	43.2	41.7
Did not attend physical education classes at all during the week (in an average week when they were in school)	291	32.2	1821	32.7	45.0	48.4
Had a concussion from playing a sport or being physically active (one or more times during the 12 months before the survey)	80	8.8	720	12.9	-	-
Were obese (\geq 95th percentile for body mass index, based on sex- and age-specific reference data from the 2000 CDC growth charts)	42	4.8	448	8.2	11.0	13.9
Were overweight (\geq 85th percentile but $<$ 95th percentile for body mass index, based on sex- and age-specific reference data from the 2000 CDC growth charts)	87	9.9	718	13.2	15.3	16.0
Described themselves as slightly or very overweight	195	21.4	1491	26.5	31.5	31.5
Were not trying to lose weight	589	64.7	3240	57.6	54.0	54.4
OTHER HEALTH-RELATED TOPICS						
Have any long-term disabilities (long-term meaning 6 months or more)	89	10.0	594	10.8	-	-
Have any physical disabilities or long-term health problems (long-term meaning 6 months or more)	66	7.4	484	8.8	-	-
Have at least one teacher or other adult in their school that they can talk to if they have a problem	608	68.2	3668	66.6	-	-
Can talk to at least one parent or other adult family member about things that are important to them	757	84.9	4635	84.2	-	-
Did not have 8 or more hours of sleep (on an average school night)	673	74.8	4371	78.8	78.0	72.7
Did not usually sleep in parent/guardian's home	10	1.1	113	2.0	-	-

(during the 30 days before the survey)						
Slept outside parent/guardian's home because were kicked out, ran away, or were abandoned (ever during the 30 days before the survey)	16	1.7	159	2.8	-	-

Table 2: Arlington's High School Responses to Drug Free Communities Questions

	n	%	n	%	n	%	n	%
	No Risk		Slight Risk		Moderate Risk		Great Risk	
How much do you think people risk harming themselves physically or in other ways when they have five or more drinks of an alcoholic beverage once or twice a week?	40	4.4	138	15.1	382	41.8	354	38.7
How much do you think people risk harming themselves physically or in other ways if they smoke one or more packs of cigarettes per day?	50	5.4	36	3.9	182	19.8	650	70.8
How much do you think people risk harming themselves physically or in other ways if they smoke marijuana once or twice a week?	203	22.3	332	36.4	254	27.9	123	13.5
How much do you think people risk harming themselves physically or in other ways if they use prescription drugs that are not prescribed to them?	24	2.6	41	4.5	214	23.5	631	69.3
How much do you think people risk harming themselves (physically or in other ways) if they take one or two drinks of an alcoholic beverage nearly every day?	54	5.9	193	21.1	330	36.0	339	37.0
	Not at All Wrong		A Little Bit Wrong		Wrong		Very Wrong	
How wrong do your parents feel it would be for you to have one or two drinks of an alcoholic beverage nearly every day?	27	2.9	56	6.1	205	22.4	628	68.6
How wrong do your parents feel it would be for you to smoke tobacco?	16	1.7	31	3.4	186	20.3	685	74.6
How wrong do your parents feel it would be for you to smoke marijuana?	42	4.6	147	16.2	250	27.5	471	51.8
How wrong do your parents feel it would be for you to use prescription drugs not prescribed to you?	11	1.2	12	1.3	92	10.1	795	87.4
How wrong do your friends feel it would be for you to have one or two drinks of an alcoholic beverage nearly every day?	63	6.9	176	19.2	351	38.3	326	35.6
How wrong do your friends feel it would be for you to smoke tobacco?	54	5.9	164	17.9	335	36.7	361	39.5
How wrong do your friends feel it would be for you to smoke marijuana?	335	36.9	232	25.5	176	19.4	166	18.3

How wrong do your friends feel it would be for you to use prescription drugs not prescribed to you?	21	2.3	60	6.6	264	29.0	564	62.0
	Neither Approve nor Disapprove		Somewhat Disapprove		Strongly Disapprove		Don't Know or Can't Say	
How do you feel about someone your age having one or two drinks of an alcoholic beverage nearly every day?	120	13.1	267	29.1	478	52.1	52	5.7

*See Regional Report for Middlesex League comparison data.

Table 3: Arlington's High School Responses by Grade Level for Males

	Freshmen		Sophomores		Juniors		Seniors		All Students	
	n	%	n	%	n	%	n	%	n	%
UNINTENTIONAL INJURY AND VIOLENCE										
Rode with a driver who had been drinking alcohol (in a car or other vehicle one or more times during the 30 days before the survey)	21	15.0	12	11.0	14	13.3	14	15.1	61	13.6
Drove when they had been drinking alcohol (in a car or other vehicle one or more times during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	1	4.8	3	6.8	4	6.3	5	8.9	13	7.0
Drove when they had been using marijuana (on at least 1 day during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	0	0.0	4	8.9	9	14.5	18	32.1	31	16.8
Talked on a cell phone while driving a car or other vehicle (on at least 1 day during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	2	9.5	2	4.8	14	22.2	29	50.9	47	25.7
Texted or e-mailed while driving a car or other vehicle (on at least 1 day during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	2	8.3	5	11.6	9	14.1	23	40.4	39	20.7
Carried a weapon (such as, a gun, knife, or club, on at least 1 day during the 30 days before the survey)	15	10.7	12	11.1	15	14.6	11	11.8	53	11.9
Carried a weapon on school property	3	2.1	2	1.9	6	5.9	4	4.3	15	3.4

(such as, a gun, knife, or club, on at least 1 day during the 30 days before the survey)										
Carried a gun (1 or more times during the 12 months before the survey)	3	2.2	1	0.9	6	5.7	3	3.3	13	2.9
Were threatened or injured with a weapon on school property (such as, a gun, knife, or club, 1 or more times during the 12 months before the survey)	3	2.1	5	4.6	6	5.7	4	4.3	18	4.0
Were in a physical fight (one or more times during the 12 months before the survey)	22	15.7	23	21.1	25	23.8	15	16.3	85	19.1
Were in a physical fight on school property (one or more times during the 12 months before the survey)	4	2.9	6	5.6	10	9.7	4	4.3	24	5.4
Were a member of a gang (during the 12 months before the survey)	12	8.7	6	5.5	8	7.8	4	4.3	30	6.8
Did not go to school because they felt unsafe at school or on their way to or from school (on at least 1 day during the 30 days before the survey)	4	2.9	2	1.9	6	5.8	5	5.5	17	3.8
Were electronically bullied (counting being bullied through e-mail, chat rooms, instant messaging, Web sites, or texting during the 12 months before the survey)	14	10.0	6	5.5	7	6.7	6	6.5	33	7.4
Were bullied on school property (during the 12 months before the survey)	20	14.4	9	8.3	8	7.6	8	8.6	45	10.1
Were ever physically forced to have sexual intercourse (when they did not want to)	2	1.4	1	0.9	4	3.8	1	1.1	8	1.8
Experienced physical dating violence (counting being hit, slammed into something, or injured with an object or weapon on purpose by someone they were dating or going out with 1 or more times during the 12 months before the survey, among students who dated or went out with someone during the 12 months before the survey)	1	0.7	0	0.0	5	4.8	2	2.2	8	1.8
Experienced sexual violence (counting kissing, touching, or being physically forced to have sexual intercourse when they did not want to 1 or more times during the 12 months before the survey)	1	0.7	2	1.9	4	3.8	5	5.5	12	2.7
Experienced sexual dating violence (counting kissing, touching, or being physically forced to have sexual intercourse when they did not want to by someone they were dating or going out with 1 or more times during the 12 months before the survey, among	1	0.7	1	0.9	5	4.8	3	3.2	10	2.2

students who dated or went out with someone during the 12 months before the survey)										
MENTAL HEALTH										
Felt sad or hopeless (almost every day for 2 or more weeks in a row so that they stopped doing some usual activities during the 12 months before the survey)	18	13.0	19	17.4	15	14.3	15	16.3	67	15.1
Did something to purposefully hurt themselves without wanting to die (such as cutting or burning themselves on purpose, 1 or more times during the 12 months before the survey)	10	7.1	6	5.6	11	10.6	9	9.8	36	8.1
Seriously considered attempting suicide (during the 12 months before the survey)	2	1.4	8	7.4	12	11.9	11	12.0	33	7.5
Made a plan about how they would attempt suicide (during the 12 months before the survey)	4	2.9	3	2.8	10	9.5	8	8.8	25	5.6
Attempted suicide (one or more times during the 12 months before the survey)	0	0.0	1	0.9	2	2.0	3	3.3	6	1.4
Attempted suicide that resulted in an injury, poisoning, or overdose that had to be treated by a doctor or nurse (during the 12 months before the survey)	0	0.0	1	0.9	1	1.0	0	0.0	2	0.5
Are currently taking medicine or receiving treatment for behavioral health, mental health condition, or emotional problem (from a doctor or other health professional)	13	9.4	9	8.3	14	13.3	14	15.2	50	11.3
Which of the following do you find causes the most negative stress for you?										
Busy schedule (school, activities, sports, etc.)	30	21.9	40	38.1	30	29.1	22	24.7	122	28.1
Parent/family demands/expectations about academics, grades, etc.	22	16.1	13	12.4	9	8.7	6	6.7	50	11.5
Difficulty getting enough sleep	7	5.1	4	3.8	4	3.9	5	5.6	20	4.6
Extracurricular activity demands or pressures	1	0.7	4	3.8	1	1.0	2	2.2	8	1.8
School demands/expectations—such as assignments, homework, etc.	52	38.0	27	25.7	36	35.0	31	34.8	146	33.6
Social pressures from friends, peers, etc.	7	5.1	1	1.0	1	1.0	1	1.1	10	2.3
Other family or personal issues which cause emotional stress for you	8	5.8	5	4.8	5	4.9	4	4.5	22	5.1
Worrying about the future such as college, career, etc.	10	7.3	11	10.5	17	16.5	18	20.2	56	12.9
Which of the following do you find the most stressful about school?										
Having to study things you do not understand	21	15.2	14	13.2	13	12.7	9	10.2	57	13.1
Teachers expecting too much from you	9	6.5	15	14.2	10	9.8	6	6.8	40	9.2
Keeping up with schoolwork	53	38.4	42	39.6	43	42.2	35	39.8	173	39.9
Having to concentrate too long during the school day	9	6.5	8	7.5	4	3.9	5	5.7	26	6.0
Having to study things you are not interested in	20	14.5	10	9.4	15	14.7	15	17.0	60	13.8

Pressure of study	10	7.2	8	7.5	5	4.9	7	8.0	30	6.9
Getting up early in the morning to go to school	10	7.2	9	8.5	7	6.9	6	6.8	32	7.4
Going to school	6	4.3	0	0.0	5	4.9	5	5.7	16	3.7
TOBACCO										
Ever tried cigarette smoking (even one or two puffs)	10	7.2	12	11.1	14	13.3	20	21.7	56	12.6
Tried cigarette smoking before age 13 years (even one or two puffs, for the first time)	5	3.6	3	2.9	7	6.7	4	4.3	19	4.3
Currently smoked cigarettes (on at least 1 day during the 30 days before the survey)	5	3.6	3	2.8	6	5.7	5	5.4	19	4.3
Currently smoked cigarettes frequently (on 20 or more days during the 30 days before the survey)	0	0.0	0	0.0	3	2.9	2	2.2	5	1.1
Ever used electronic vapor products (including e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens)	18	12.9	19	17.6	27	26.0	37	40.7	101	22.9
Currently used electronic vapor products (including e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens on at least 1 day during the 30 days before the survey)	9	6.4	11	10.2	8	7.7	22	24.2	50	11.3
Currently used smokeless tobacco (chewing tobacco, snuff, or dip on at least 1 day during the 30 days before the survey)	0	0.0	4	3.7	4	3.8	5	5.4	13	2.9
Currently smoked cigars (cigars, cigarillos, or little cigars on at least 1 day during the 30 days before the survey)	2	1.4	5	4.6	5	4.8	8	8.7	20	4.5
ALCOHOL AND DRUGS										
Ever drank alcohol (at least one drink of alcohol on at least 1 day during their life)	71	51.8	49	46.7	60	57.1	66	72.5	246	56.2
Drank alcohol before age 13 years (for the first time other than a few sips)	13	9.4	9	8.3	10	9.6	6	6.5	38	8.6
Currently drank alcohol (at least one drink of alcohol on at least 1 day during the 30 days before the survey)	22	16.1	23	21.5	35	33.3	37	40.7	117	26.6
Currently drank alcohol on school property (at least 1 drink of alcohol on school property on at least 1 day during the 30 days before the survey)	1	0.7	2	1.8	5	4.8	3	3.3	11	2.5

Drank 4 or more (for females) or 5 or more (for males) drinks of alcohol in a row (on at least 1 day during the 30 days before the survey)	10	7.1	12	11.0	22	21.2	27	29.7	71	16.0
Ever used marijuana (one or more times during their life)	21	15.1	29	27.1	40	38.5	53	58.2	143	32.4
Tried marijuana before age 13 years (for the first time)	2	1.4	3	2.8	6	5.8	3	3.3	14	3.2
Currently used marijuana (one or more times during the 30 days before the survey)	14	10.0	18	16.7	25	23.8	41	45.1	98	22.1
Currently used marijuana or hashish (during the past 30 days)	12	8.6	22	20.4	25	23.8	40	44.0	99	22.3
Currently used marijuana on school property (one or more times on school property during the 30 days before the survey)	4	2.9	7	6.5	8	7.7	5	5.4	24	5.4
Ever used cocaine (any form of cocaine, such as powder, crack, or freebase, one or more times during their life)	2	1.4	3	2.8	7	6.7	4	4.3	16	3.6
Ever used heroin (also called "smack," "junk," or "China white," one or more times during their life)	0	0.0	4	3.8	6	5.9	2	2.2	12	2.7
Ever used methamphetamines (also called "speed," "crystal," "crank," or "ice," one or more times during their life)	1	0.7	3	2.8	6	5.7	3	3.3	13	2.9
Ever used ecstasy (also called "MDMA," one or more times during their life)	2	1.4	2	1.9	6	5.8	3	3.3	13	2.9
Ever used synthetic marijuana (also called "K2," "Spice," "fake weed," "King Kong," "Yucatan Fire," "Skunk", or "Moon Rocks", one or more times during their life)	1	0.7	2	1.9	5	4.8	3	3.3	11	2.5
Ever taken over-the-counter medication to get high (including cough syrup, at least one time during their life)	3	2.2	3	2.9	5	4.8	6	6.5	17	3.9
Sniffed glue, breathed the contents of aerosol spray cans, or inhaled paints or sprays to get high (during the past 30 days)	0	0.0	2	1.9	6	5.7	3	3.3	11	2.5
Used prescription drugs not prescribed to them (during the past 30 days)	4	2.9	5	4.8	6	5.7	6	6.5	21	4.8
Were offered, sold, or given an illegal drug on school property	19	13.6	16	15.0	11	10.5	24	26.1	70	15.8

(during the 12 months before the survey)										
SEXUAL BEHAVIOR AND HIV/AIDS										
Ever had sexual intercourse	14	10.1	21	20.2	32	31.1	45	50.0	112	25.7
Were currently sexually active (had sexual intercourse with at least one person during the 3 months before the survey)	10	7.2	11	10.5	24	23.3	31	34.4	76	17.4
Had sexual intercourse before age 13 years (for the first time)	0	0.0	3	2.8	7	6.7	0	0.0	10	2.3
Had sexual intercourse with four or more persons (during their life)	5	3.6	6	5.8	9	8.7	3	3.4	23	5.3
During your life, with whom have you had sexual contact?										
I have never had sexual contact	107	77.0	70	66.7	60	57.7	38	41.3	275	62.5
Females	30	21.6	32	30.5	39	37.5	50	54.3	151	34.3
Males	1	0.7	1	1.0	0	0.0	2	2.2	4	0.9
Females and males	1	0.7	2	1.9	5	4.8	2	2.2	10	2.3
Drank alcohol or used drugs before last sexual intercourse (among students who were currently sexually active)	2	13.3	5	22.7	8	21.6	11	22.9	26	21.3
Have been pregnant or gotten someone pregnant (at least one time)	1	0.7	3	2.8	5	4.8	0	0.0	9	2.1
Did not use a condom (during last sexual intercourse, among students who were currently sexually active)	2	15.4	3	15.0	13	41.9	10	22.2	28	25.7
Did not use any method to prevent pregnancy (during last sexual intercourse, among students who were currently sexually active)	0	0.0	2	10.0	3	10.3	0	0.0	5	4.7
Ever sent or received sexual messages or nude or semi-nude pictures or videos electronically	43	30.7	40	37.4	42	40.8	43	47.3	168	38.1
Ever been tested for HIV (not counting tests done if donated blood)	3	2.2	6	5.7	9	8.7	6	6.7	24	5.5
Ever been tested for sexually transmitted diseases (STDs) (such as genital herpes, chlamydia, syphilis, or genital warts)	4	2.9	9	8.7	12	11.5	8	9.0	33	7.6
Ever been taught in school about AIDS or HIV infection	120	87.0	79	75.2	82	78.8	73	82.0	354	81.2
Ever been taught in school about how to use condoms	87	62.6	62	59.6	59	56.7	44	50.0	252	57.9
Ever been taught in school about birth control methods	125	90.6	85	81.0	87	83.7	74	84.1	371	85.3
Talked with family members about sexual health	73	52.9	48	45.7	43	41.3	40	44.9	204	46.8

(talked with parents or other adults in their family about sexuality or ways to prevent HIV infection, other sexually transmitted diseases (STDs), or pregnancy at least once during the 12 months before the survey)										
Have an adult in their school who can help them find sexual health services (such as HIV, STD and pregnancy testing, access to birth control, or support around their sexuality)	68	49.3	54	51.4	37	35.6	48	53.9	207	47.5
Feel comfortable asking an adult at their school if they needed help finding sexual health services	35	25.5	32	30.5	19	18.4	32	36.0	118	27.2
NUTRITION AND PHYSICAL ACTIVITY										
Did not eat fruit or drink 100% fruit juices (during the 7 days before the survey)	6	4.3	4	3.8	5	4.9	1	1.1	16	3.7
Did not eat vegetables (green salad, potatoes (excluding French fries, fried potatoes, or potato chips), carrots, or other vegetables, during the 7 days before the survey)	6	4.4	3	2.9	2	2.0	3	3.3	14	3.2
Did not drink milk (during the 7 days before the survey)	12	8.7	24	22.4	11	10.6	18	19.8	65	14.8
Drank a can, bottle, or glass of soda or pop (not counting diet soda or diet pop, during the 7 days before the survey)	92	66.2	60	57.1	69	66.3	57	62.6	278	63.3
Did not eat breakfast any day during the week (during the 7 days before the survey)	8	5.7	10	9.3	7	6.7	9	9.9	34	7.7
Did not eat breakfast at least one day during the week (during the 7 days before the survey)	48	88.9	43	84.3	46	83.6	40	81.6	177	84.7
Were not physically active at least 60 minutes per day on any day during the week (doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time during the 7 days before the survey)	2	1.4	9	8.6	7	6.8	13	14.4	31	7.1
Were not physically active at least 60 minutes per day on 5 or more days during the week (doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time during the 7 days before the survey)	86	62.3	68	64.8	70	68.0	66	73.3	290	66.5
Played video or computer games or used a computer 3 or more hours per day (for something that was not school work on an average school day)	69	49.6	40	37.4	43	41.7	48	53.3	200	45.6
Did not attend physical education classes any day during the week (in an average week when they were in school)	3	2.2	1	0.9	63	61.2	73	81.1	140	32.0

Had a concussion from playing a sport or being physically active (one or more times during the 12 months before the survey)	12	8.6	14	13.2	12	11.5	9	10.0	47	10.7
Were obese (≥ 95th percentile for body mass index, based on sex- and age-specific reference data from the 2000 CDC growth charts)	7	5.4	5	4.8	4	4.0	5	5.6	21	5.0
Were overweight (≥ 85th percentile but <95th percentile for body mass index, based on sex- and age-specific reference data from the 2000 CDC growth charts)	14	10.9	13	12.5	6	6.1	7	7.9	40	9.5
Described themselves as slightly or very overweight	24	17.1	16	15.1	19	18.4	15	16.5	74	16.8
Were not trying to lose weight	114	82.0	85	80.2	84	81.6	73	79.3	356	80.9
OTHER HEALTH-RELATED TOPICS										
Have any long-term disabilities (long-term meaning 6 months or more)	10	7.2	10	9.8	15	14.4	8	9.0	43	9.9
Have any physical disabilities or long-term health problems (long-term meaning 6 months or more)	11	7.9	4	3.9	7	6.9	8	8.9	30	6.9
Have at least one teacher or other adult in their school that they can talk to if they have a problem	110	79.7	72	69.9	60	57.7	63	71.6	305	70.4
Can talk to at least one parent or other adult family member about things that are important to them	124	90.5	85	81.0	86	83.5	77	87.5	372	85.9
Did not have 8 or more hours of sleep (on an average school night)	87	62.6	66	63.5	85	82.5	69	76.7	307	70.4
Did not usually sleep in parent/guardian's home (during the 30 days before the survey)	1	0.7	1	0.9	2	1.9	2	2.2	6	1.3
Slept outside parent/guardian's home because were kicked out, ran away, or were abandoned (ever during the 30 days before the survey)	4	2.9	2	1.8	3	2.9	3	3.2	12	2.7

*See Regional Report for Middlesex League comparison data.

Table 4: Arlington's High School Responses by Grade Level for Females

	Freshmen		Sophomores		Juniors		Seniors		All Students	
	n	%	n	%	n	%	n	%	n	%
UNINTENTIONAL INJURY AND VIOLENCE										

Rode with a driver who had been drinking alcohol (in a car or other vehicle one or more times during the 30 days before the survey)	11	8.1	16	10.9	12	12.9	13	13.4	52	11.0
Drove when they had been drinking alcohol (in a car or other vehicle one or more times during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	0	0.0	1	2.0	2	3.2	2	3.6	5	2.6
Drove when they had been using marijuana (on at least 1 day during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	0	0.0	2	3.9	4	6.7	8	13.6	14	7.4
Talked on a cell phone while driving a car or other vehicle (on at least 1 day during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	1	6.3	4	7.8	8	13.3	28	50.9	41	22.5
Texted or e-mailed while driving a car or other vehicle (on at least 1 day during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey)	0	0.0	4	7.8	7	11.3	18	33.3	29	15.8
Carried a weapon (such as, a gun, knife, or club, on at least 1 day during the 30 days before the survey)	0	0.0	4	2.7	5	5.4	1	1.0	10	2.1
Carried a weapon on school property (such as, a gun, knife, or club, on at least 1 day during the 30 days before the survey)	0	0.0	1	0.7	3	3.2	1	1.0	5	1.1
Carried a gun (1 or more times during the 12 months before the survey)	0	0.0	0	0.0	1	1.1	0	0.0	1	0.2
Were threatened or injured with a weapon on school property (such as, a gun, knife, or club, 1 or more times during the 12 months before the survey)	2	1.5	3	2.0	2	2.1	0	0.0	7	1.5
Were in a physical fight (one or more times during the 12 months before the survey)	12	9.0	11	7.4	5	5.4	6	6.1	34	7.2
Were in a physical fight on school property (one or more times during the 12 months before the survey)	2	1.5	5	3.4	2	2.2	0	0.0	9	1.9
Were a member of a gang (during the 12 months before the survey)	4	3.0	2	1.4	7	7.7	6	6.2	19	4.0
Did not go to school because they felt unsafe at school or on their way to or from school (on at least 1 day during the 30 days before the survey)	2	1.5	5	3.4	4	4.3	3	3.0	14	2.9

Were electronically bullied (counting being bullied through e-mail, chat rooms, instant messaging, Web sites, or texting during the 12 months before the survey)	19	14.1	18	12.1	13	13.8	13	13.1	63	13.2
Were bullied on school property (during the 12 months before the survey)	17	12.6	19	12.8	17	18.1	10	10.2	63	13.3
Were ever physically forced to have sexual intercourse (when they did not want to)	4	3.0	8	5.4	7	7.5	10	10.1	29	6.1
Experienced physical dating violence (counting being hit, slammed into something, or injured with an object or weapon on purpose by someone they were dating or going out with 1 or more times during the 12 months before the survey, among students who dated or went out with someone during the 12 months before the survey)	2	1.5	1	0.7	7	7.5	0	0.0	10	2.1
Experienced sexual violence (counting kissing, touching, or being physically forced to have sexual intercourse when they did not want to 1 or more times during the 12 months before the survey)	8	6.0	16	10.9	10	10.8	14	14.1	48	10.1
Experienced sexual dating violence (counting kissing, touching, or being physically forced to have sexual intercourse when they did not want to by someone they were dating or going out with 1 or more times during the 12 months before the survey, among students who dated or went out with someone during the 12 months before the survey)	4	3.0	9	6.1	7	7.5	9	9.4	29	6.2
MENTAL HEALTH										
Felt sad or hopeless (almost every day for 2 or more weeks in a row so that they stopped doing some usual activities during the 12 months before the survey)	33	24.6	52	35.4	38	41.3	39	39.4	162	34.3
Did something to purposefully hurt themselves without wanting to die (such as cutting or burning themselves on purpose, 1 or more times during the 12 months before the survey)	28	20.9	34	23.1	25	27.2	19	19.4	106	22.5
Seriously considered attempting suicide (during the 12 months before the survey)	24	18.0	34	23.1	18	19.8	18	18.2	94	20.0
Made a plan about how they would attempt suicide (during the 12 months before the survey)	12	9.0	26	17.7	12	13.0	13	13.1	63	13.4
Attempted suicide (one or more times during the 12 months before the survey)	1	0.7	7	4.7	6	6.5	6	6.1	20	4.2

Attempted suicide that resulted in an injury, poisoning, or overdose that had to be treated by a doctor or nurse (during the 12 months before the survey)	0	0.0	2	1.4	1	1.1	3	3.0	6	1.3
Are currently taking medicine or receiving treatment for behavioral health, mental health condition, or emotional problem (from a doctor or other health professional)	18	13.5	36	24.5	22	24.4	26	26.5	102	21.8
Which of the following do you find causes the most negative stress for you?										
Busy schedule (school, activities, sports, etc.)	33	25.6	43	29.5	23	26.1	19	20.2	118	25.8
Parent/family demands/expectations about academics, grades, etc.	15	11.6	10	6.8	8	9.1	4	4.3	37	8.1
Difficulty getting enough sleep	6	4.7	1	0.7	5	5.7	4	4.3	16	3.5
Extracurricular activity demands or pressures	2	1.6	5	3.4	1	1.1	2	2.1	10	2.2
School demands/expectations—such as assignments, homework, etc.	39	30.2	65	44.5	23	26.1	30	31.9	157	34.4
Social pressures from friends, peers, etc.	4	3.1	6	4.1	3	3.4	1	1.1	14	3.1
Other family or personal issues which cause emotional stress for you	17	13.2	6	4.1	10	11.4	8	8.5	41	9.0
Worrying about the future such as college, career, etc.	13	10.1	10	6.8	15	17.0	26	27.7	64	14.0
Which of the following do you find the most stressful about school?										
Having to study things you do not understand	28	21.5	28	19.2	7	8.0	21	22.1	84	18.3
Teachers expecting too much from you	21	16.2	29	19.9	13	14.8	7	7.4	70	15.3
Keeping up with schoolwork	41	31.5	50	34.2	35	39.8	25	26.3	151	32.9
Having to concentrate too long during the school day	9	6.9	7	4.8	2	2.3	7	7.4	25	5.4
Having to study things you are not interested in	10	7.7	11	7.5	6	6.8	10	10.5	37	8.1
Pressure of study	8	6.2	12	8.2	9	10.2	11	11.6	40	8.7
Getting up early in the morning to go to school	12	9.2	6	4.1	11	12.5	4	4.2	33	7.2
Going to school	1	0.8	3	2.1	5	5.7	10	10.5	19	4.1
TOBACCO										
Ever tried cigarette smoking (even one or two puffs)	7	5.3	14	9.5	15	16.5	13	13.3	49	10.4
Tried cigarette smoking before age 13 years (even one or two puffs, for the first time)	0	0.0	5	3.4	4	4.3	3	3.0	12	2.5
Currently smoked cigarettes (on at least 1 day during the 30 days before the survey)	1	0.8	6	4.1	7	7.8	5	5.1	19	4.1
Currently smoked cigarettes frequently (on 20 or more days during the 30 days before the survey)	0	0.0	0	0.0	0	0.0	2	2.0	2	0.4
Ever used electronic vapor products (including e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens)	14	10.4	29	19.6	22	23.9	31	31.3	96	20.3

Currently used electronic vapor products (including e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens on at least 1 day during the 30 days before the survey)	6	4.4	12	8.1	4	4.3	4	4.0	26	5.5
Currently used smokeless tobacco (chewing tobacco, snuff, or dip on at least 1 day during the 30 days before the survey)	0	0.0	1	0.7	0	0.0	1	1.0	2	0.4
Currently smoked cigars (cigars, cigarillos, or little cigars on at least 1 day during the 30 days before the survey)	1	0.7	3	2.0	3	3.3	0	0.0	7	1.5
ALCOHOL AND DRUGS										
Ever drank alcohol (at least one drink of alcohol on at least 1 day during their life)	59	44.0	78	53.8	66	72.5	69	69.7	272	58.0
Drank alcohol before age 13 years (for the first time other than a few sips)	15	11.1	7	4.7	6	6.7	8	8.1	36	7.6
Currently drank alcohol (at least one drink of alcohol on at least 1 day during the 30 days before the survey)	27	20.3	36	24.5	28	31.1	45	45.9	136	29.1
Currently drank alcohol on school property (at least 1 drink of alcohol on school property on at least 1 day during the 30 days before the survey)	5	3.8	4	2.7	6	6.7	4	4.1	19	4.1
Drank 4 or more (for females) or 5 or more (for males) drinks of alcohol in a row (on at least 1 day during the 30 days before the survey)	14	10.4	20	13.7	12	13.0	29	29.6	75	15.9
Ever used marijuana (one or more times during their life)	24	18.2	39	26.7	45	48.9	42	42.9	150	32.1
Tried marijuana before age 13 years (for the first time)	1	0.8	2	1.4	0	0.0	2	2.0	5	1.1
Currently used marijuana (one or more times during the 30 days before the survey)	12	9.0	24	16.3	24	26.4	28	28.3	88	18.7
Currently used marijuana or hashish (during the past 30 days)	15	11.3	22	15.0	23	25.6	27	27.6	87	18.6
Currently used marijuana on school property (one or more times on school property during the 30 days before the survey)	2	1.5	1	0.7	4	4.4	0	0.0	7	1.5
Ever used cocaine (any form of cocaine, such as powder, crack, or freebase, one or more times)	0	0.0	2	1.4	5	5.5	2	2.0	9	1.9

during their life)										
Ever used heroin (also called "smack," "junk," or "China white," one or more times during their life)	0	0.0	0	0.0	1	1.1	1	1.0	2	0.4
Ever used methamphetamines (also called "speed," "crystal," "crank," or "ice," one or more times during their life)	0	0.0	0	0.0	2	2.2	1	1.0	3	0.6
Ever used ecstasy (also called "MDMA," one or more times during their life)	0	0.0	3	2.0	2	2.2	3	3.0	8	1.7
Ever used synthetic marijuana (also called "K2," "Spice," "fake weed," "King Kong," "Yucatan Fire," "Skunk", or "Moon Rocks", one or more times during their life)	1	0.8	3	2.0	3	3.3	2	2.0	9	1.9
Ever taken over-the-counter medication to get high (including cough syrup, at least one time during their life)	2	1.5	9	6.1	6	6.7	4	4.1	21	4.5
Sniffed glue, breathed the contents of aerosol spray cans, or inhaled paints or sprays to get high (during the past 30 days)	1	0.8	0	0.0	1	1.1	0	0.0	2	0.4
Used prescription drugs not prescribed to them (during the past 30 days)	1	0.8	6	4.1	8	8.8	5	5.1	20	4.3
Were offered, sold, or given an illegal drug on school property (during the 12 months before the survey)	14	10.7	14	9.5	12	13.0	13	13.1	53	11.3
SEXUAL BEHAVIOR AND HIV/AIDS										
Ever had sexual intercourse	7	5.3	31	21.2	28	31.1	35	36.5	101	21.8
Were currently sexually active (had sexual intercourse with at least one person during the 3 months before the survey)	6	4.5	24	16.2	22	24.4	28	29.2	80	17.2
Had sexual intercourse before age 13 years (for the first time)	0	0.0	1	0.7	0	0.0	1	1.1	2	0.4
Had sexual intercourse with four or more persons (during their life)	0	0.0	3	2.1	7	7.8	7	7.4	17	3.7
During your life, with whom have you had sexual contact?										
I have never had sexual contact	107	81.1	98	66.7	47	52.8	47	50.0	299	64.7
Females	2	1.5	2	1.4	3	3.4	1	1.1	8	1.7
Males	21	15.9	41	27.9	29	32.6	41	43.6	132	28.6
Females and males	2	1.5	6	4.1	10	11.2	5	5.3	23	5.0

Drank alcohol or used drugs before last sexual intercourse (among students who were currently sexually active)	2	25.0	5	15.6	6	18.8	6	17.1	19	17.8
Have been pregnant or gotten someone pregnant (at least one time)	0	0.0	1	0.7	0	0.0	2	2.1	3	0.7
Did not use a condom (during last sexual intercourse, among students who were currently sexually active)	1	20.0	9	29.0	11	39.3	13	37.1	34	34.3
Did not use any method to prevent pregnancy (during last sexual intercourse, among students who were currently sexually active)	1	25.0	4	12.9	2	7.1	2	5.7	9	9.2
Ever sent or received sexual messages or nude or semi-nude pictures or videos electronically	37	28.2	55	37.7	39	44.3	41	43.2	172	37.4
Ever been tested for HIV (not counting tests done if donated blood)	3	2.3	7	4.8	5	5.6	10	10.4	25	5.4
Ever been tested for sexually transmitted diseases (STDs) (such as genital herpes, chlamydia, syphilis, or genital warts)	1	0.8	10	6.8	9	10.2	14	14.7	34	7.4
Ever been taught in school about AIDS or HIV infection	117	90.7	129	88.4	55	63.2	74	77.9	375	82.1
Ever been taught in school about how to use condoms	75	57.7	65	44.8	31	35.2	46	48.4	217	47.4
Ever been taught in school about birth control methods	118	90.8	111	76.0	57	65.5	70	73.7	356	77.7
Talked with family members about sexual health (talked with parents or other adults in their family about sexuality or ways to prevent HIV infection, other sexually transmitted diseases (STDs), or pregnancy at least once during the 12 months before the survey)	73	56.6	82	56.2	36	40.9	47	49.5	238	52.0
Have an adult in their school who can help them find sexual health services (such as HIV, STD and pregnancy testing, access to birth control, or support around their sexuality)	64	49.6	59	40.7	34	39.1	44	46.3	201	44.1
Feel comfortable asking an adult at their school if they needed help finding sexual health services	21	16.2	28	19.2	17	19.5	30	31.6	96	21.0
NUTRITION AND PHYSICAL ACTIVITY										
Did not eat fruit or drink 100% fruit juices (during the 7 days before the survey)	0	0.0	4	2.7	5	5.6	0	0.0	9	2.0
Did not eat vegetables (green salad, potatoes (excluding French fries, fried potatoes, or potato chips), carrots, or other vegetables, during the 7 days before the survey)	0	0.0	3	2.1	2	2.3	1	1.1	6	1.3
Did not drink milk	28	21.5	42	28.6	21	23.3	31	32.3	122	26.3

(during the 7 days before the survey)										
Drank a can, bottle, or glass of soda or pop (not counting diet soda or diet pop, during the 7 days before the survey)	62	47.7	58	39.5	36	40.0	36	37.5	192	41.5
Did not eat breakfast any day during the week (during the 7 days before the survey)	12	9.2	5	3.4	3	3.4	8	8.3	28	6.1
Did not eat breakfast at least one day during the week (during the 7 days before the survey)	55	77.5	66	86.8	42	87.5	43	81.1	206	83.1
Were not physically active at least 60 minutes per day on any day during the week (doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time during the 7 days before the survey)	9	6.9	13	8.8	14	15.7	16	16.7	52	11.3
Were not physically active at least 60 minutes per day on 5 or more days during the week (doing any kind of physical activity that increased their heart rate and made them breathe hard some of the time during the 7 days before the survey)	98	75.4	119	81.0	80	89.9	84	87.5	381	82.5
Played video or computer games or used a computer 3 or more hours per day (for something that was not school work on an average school day)	58	44.3	74	50.3	35	38.9	39	40.6	206	44.4
Did not attend physical education classes any day during the week (in an average week when they were in school)	1	0.8	5	3.4	69	76.7	74	77.9	149	32.3
Had a concussion from playing a sport or being physically active (one or more times during the 12 months before the survey)	10	7.6	10	6.8	8	9.0	5	5.2	33	7.1
Were obese (≥ 95th percentile for body mass index, based on sex- and age-specific reference data from the 2000 CDC growth charts)	5	3.9	7	4.9	4	4.7	5	5.2	21	4.6
Were overweight (≥ 85th percentile but <95th percentile for body mass index, based on sex- and age-specific reference data from the 2000 CDC growth charts)	14	10.9	12	8.5	10	11.8	10	10.3	46	10.2
Described themselves as slightly or very overweight	33	25.0	34	23.0	22	24.7	32	33.3	121	26.0
Were not trying to lose weight	69	52.3	74	50.0	44	49.4	40	42.1	227	48.9
OTHER HEALTH-RELATED TOPICS										
Have any long-term disabilities (long-term meaning 6 months or more)	7	5.6	17	11.7	15	17.0	6	6.3	45	9.9
Have any physical disabilities or long-term health problems (long-term meaning 6 months or more)	8	6.3	12	8.3	8	9.1	7	7.4	35	7.7

Have at least one teacher or other adult in their school that they can talk to if they have a problem	84	66.7	98	68.1	54	62.1	62	65.3	298	65.9
Can talk to at least one parent or other adult family member about things that are important to them	110	88.0	126	86.9	69	78.4	76	80.0	381	84.1
Did not have 8 or more hours of sleep (on an average school night)	91	71.7	118	80.8	71	79.8	82	85.4	362	79.0
Did not usually sleep in parent/guardian's home (during the 30 days before the survey)	0	0.0	2	1.4	1	1.1	1	1.0	4	0.8
Slept outside parent/guardian's home because were kicked out, ran away, or were abandoned (ever during the 30 days before the survey)	1	0.7	0	0.0	2	2.2	0	0.0	3	0.6

**See Regional Report for Middlesex League comparison data.*

Appendix B: Additional Questions

Arlington's High School Additional Questions		
	n	%
During the past 12 months, how many times has someone stolen or deliberately damaged your property such as your car, clothing, or books on school property during the school day?		
0 times	809	88.2
1 time	69	7.5
2 or 3 times	29	3.2
4 or 5 times	6	0.7
6 or more times	4	0.4
During the past 12 months, how many times have you been verbally or emotionally abused by someone you date or have dated?		
0 times	856	93.1
1 time	22	2.4
2 or 3 times	19	2.1
4 or 5 times	8	0.9
6 or more times	14	1.5
During the past 12 months, have you ever been physically abused by being kicked, punched, burned or beaten by a parent or other adult who lives with you?		
0 times	864	93.8
1 time	32	3.5
2 or 3 times	18	2.0
4 or 5 times	7	0.8
6 or more times	0	0.0
During the past 30 days, on how many days did you smoke cigarettes or Vape tobacco on school property?		
0 days	895	97.7
1 or 2 days	9	1.0
3 to 5 days	6	0.7
6 to 9 days	0	0.0
10 to 19 days	1	0.1
20 to 29 days	0	0.0
All 30 days	5	0.6
During the past 12 months, have you been a member of an AHS school's sponsored athletic team? (Varsity, Junior Varsity, or Freshman team)?		
No	415	46.0
Yes	487	54.0
How often do you feel like you are under too much stress?		
Not at all or hardly ever	87	9.7
Sometimes	384	42.8
Most of the time or always	426	47.5
Which one of the following adults have you found most helpful/valuable in helping you with health-related issues including emotional health?		

Parents or adult relative	536	60.1
School teacher	22	2.5
School guidance counselor/psychologist	36	4.0
School nurse	7	0.8
Non-school professional such as a doctor, clergy, social worker	70	7.9
Adult friend	50	5.6
Other	32	3.6
I have not tried seeking help from an adult	139	15.6

Appendix C: Student Characteristics

Arlington's High School Student Characteristics				
	Arlington		Middlesex League	
	n	%	n	%
How old are you?				
12 years old or younger	0	0.0	23	0.4
13 years old	0	0.0	4	0.1
14 years old	85	9.2	499	8.6
15 years old	283	30.5	1537	26.5
16 years old	242	26.1	1527	26.4
17 years old	203	21.9	1381	23.9
18 years old or older	114	12.3	819	14.1
In what grade are you?				
9 th grade	275	29.7	1629	28.2
10 th grade	259	28.0	1521	26.3
11 th grade	200	21.6	1418	24.5
12 th grade	192	20.7	1186	20.5
Ungraded or other grade	0	0.0	25	0.4
What is your sex?				
Male	478	51.6	2998	51.9
Female	448	48.4	2778	48.1
What is your race? (Select one of more responses)				
American Indian or Alaska Native	1	0.1	31	0.5
Asian	106	11.7	514	9.0
Black or African American	36	4.0	273	4.8
Native Hawaiian or Other Pacific Islander	9	1.0	47	0.8
White	689	75.9	4475	78.6
Multiracial	67	7.4	357	6.3
Are Hispanic or Latino	73	8.0	509	8.9
Do you consider yourself to be:				
Heterosexual (straight)	734	79.8	4819	84.0
Gay or lesbian	22	2.4	112	2.0
Bisexual	79	8.6	338	5.9
Other	30	3.3	201	3.5
Don't know/Not sure	55	6.0	265	4.6
Do you consider yourself to be transgender?				
Yes, transgender male to female	1	0.1	21	0.4
Yes, transgender female to male	10	1.1	32	0.6
Yes, transgender, gender non-conforming	10	1.1	47	0.8
No	881	96.1	5590	96.9
Don't know/Not sure	15	1.6	78	1.4
During the past 12 months, how would you describe your grades in school?				
Mostly A's	468	52.0	2356	42.5
Mostly B's	332	36.9	2310	41.7
Mostly C's	67	7.4	581	10.5
Mostly D's	16	1.8	123	2.2

Mostly F's	4	0.4	45	0.8
None of these grades	0	0.0	17	0.3
Not sure	13	1.4	109	2.0
How likely is it that you will complete a post high school program such as a vocational training program, military service, community college, or 4-year college?				
Definitely will not	63	7.1	360	6.5
Probably will not	51	5.7	277	5.0
Probably will	139	15.6	916	16.6
Definitely will	592	66.3	3636	65.9
Not sure	48	5.4	330	6.0
Have a parent or other adult family member serving on active duty in the military	41	4.6	316	5.7

Arlington High School Youth Risk Behavior Survey 2017

School Committee Presentation
9/28/2017



Cindy Bouvier
APS Wellness Department

Ivy Schmalzried
AYHSC Director

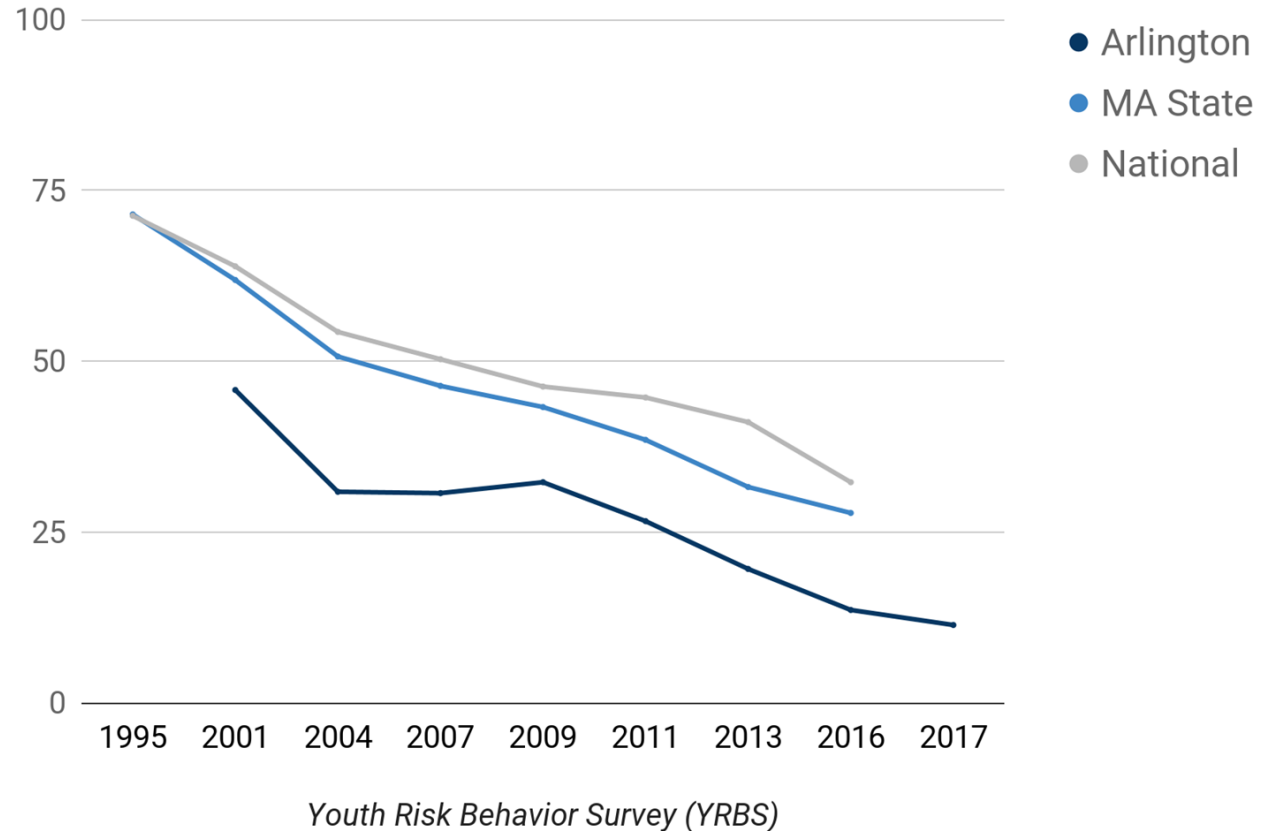


YRBS Data Trends

Arlington | Massachusetts | National

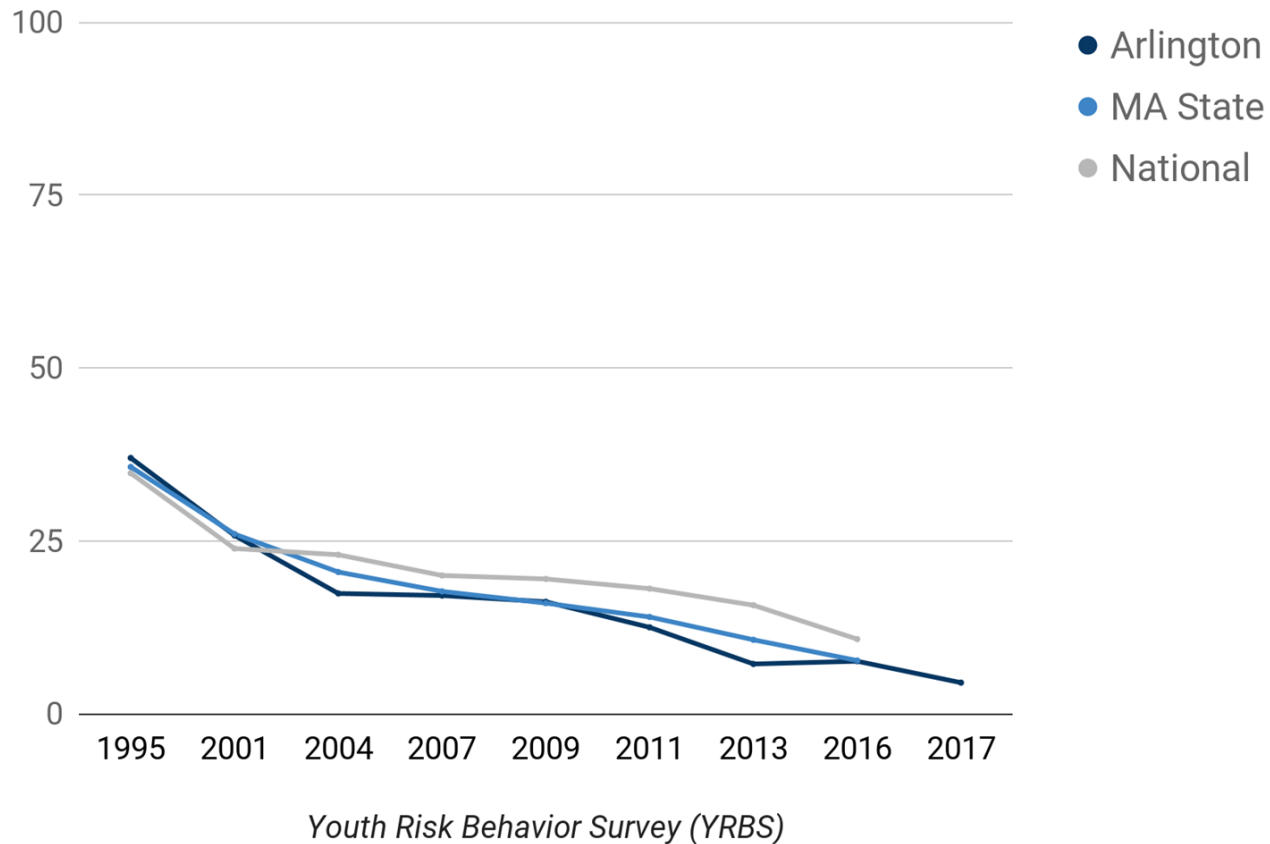
Arlington High School students report below average lifetime tobacco use, when compared to state and national data.

High School Student Reported Lifetime Tobacco Use (%)



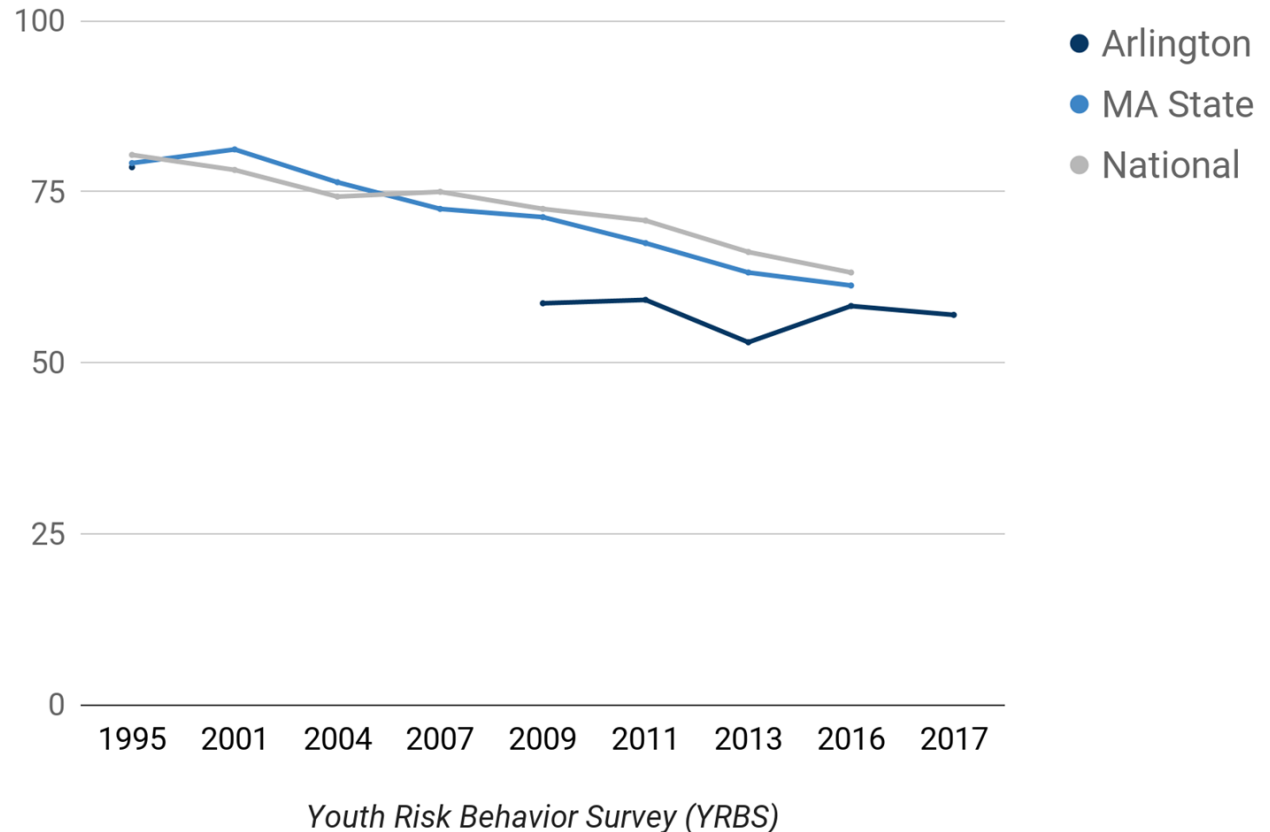
Lower than the
national average,
high school
students in
Arlington and MA
report similar
recent (past 30-
day) tobacco use.

High School Student Reported Recent Tobacco Use (%)



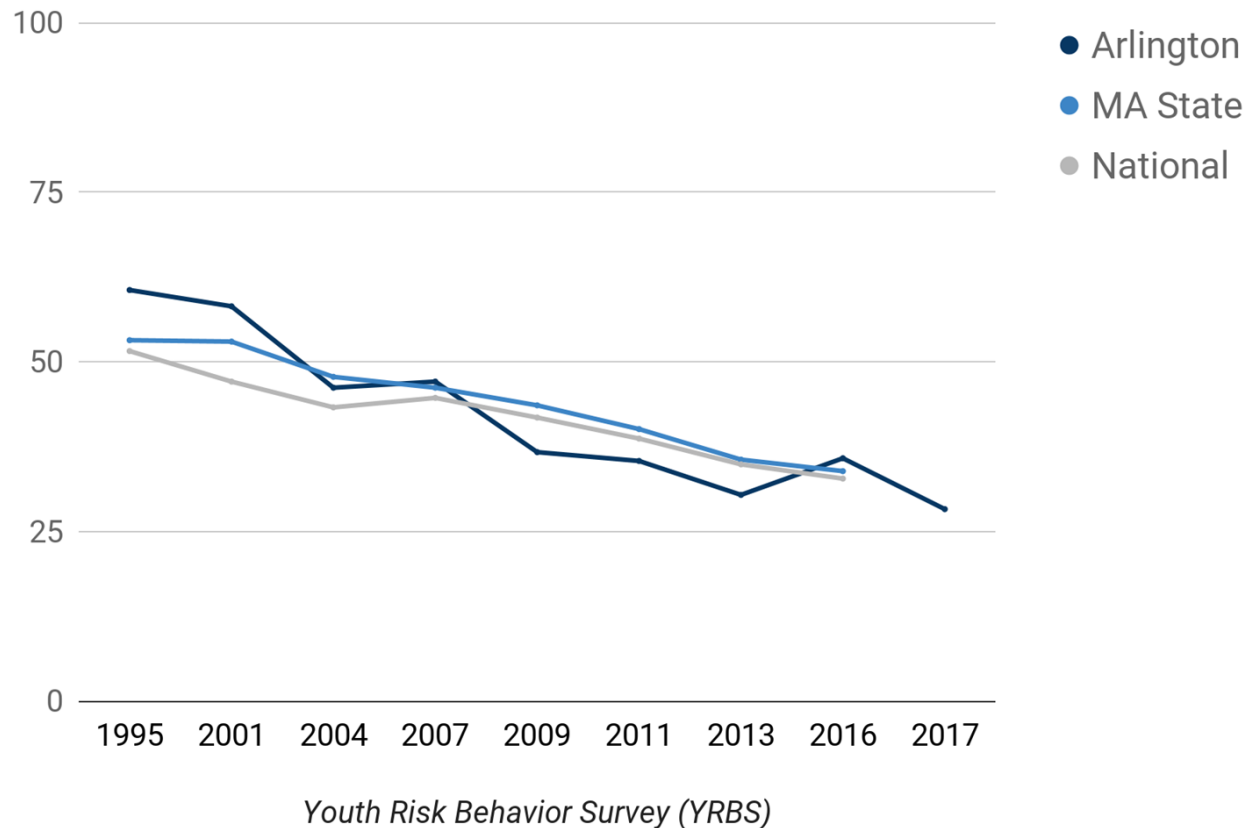
Arlington
students report
lower rates of
lifetime alcohol
use than state or
national
averages.

High School Student Reported Lifetime Alcohol Use (%)



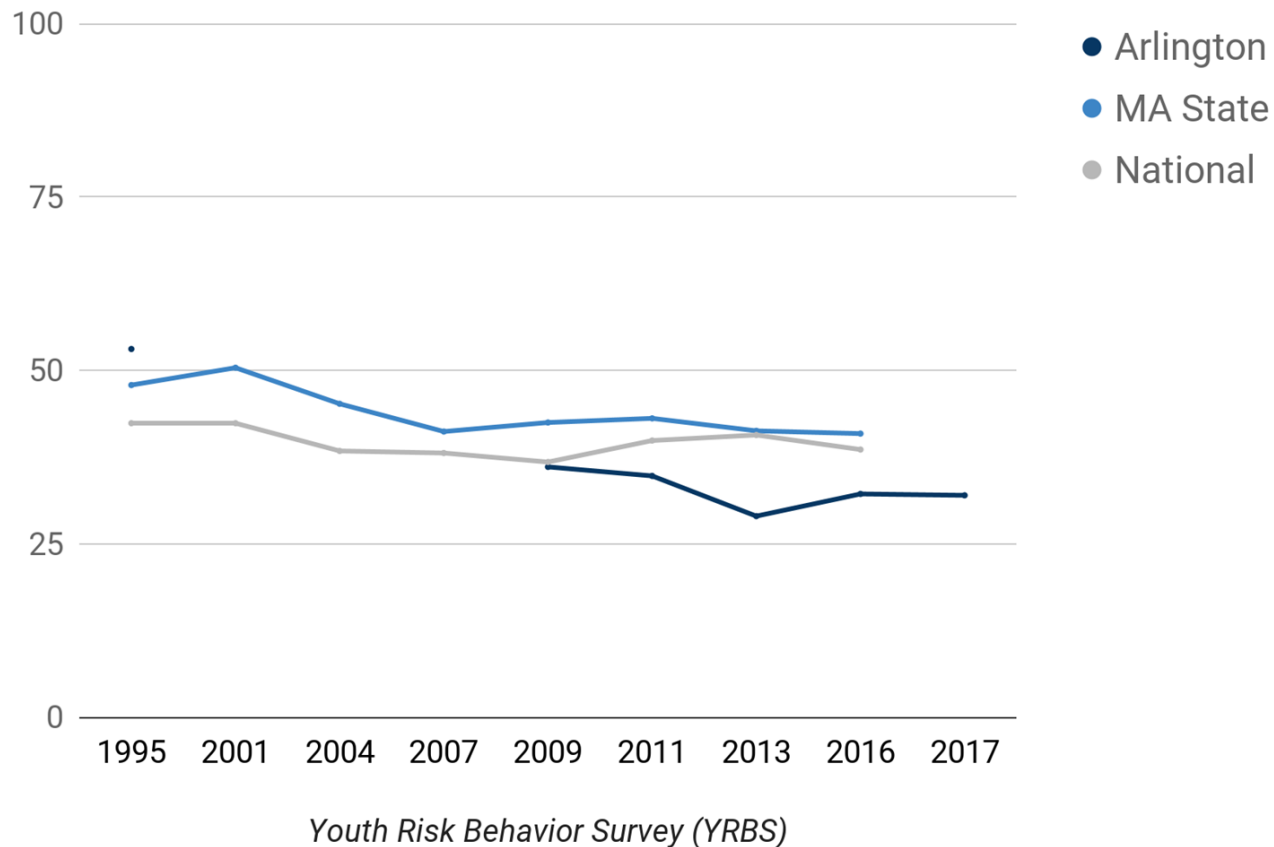
Since 1995, recent
(past 30-day)
alcohol use
reported by high
school students in
Arlington, MA, and
the US has been
declining.

High School Student Reported Recent Alcohol Use (%)



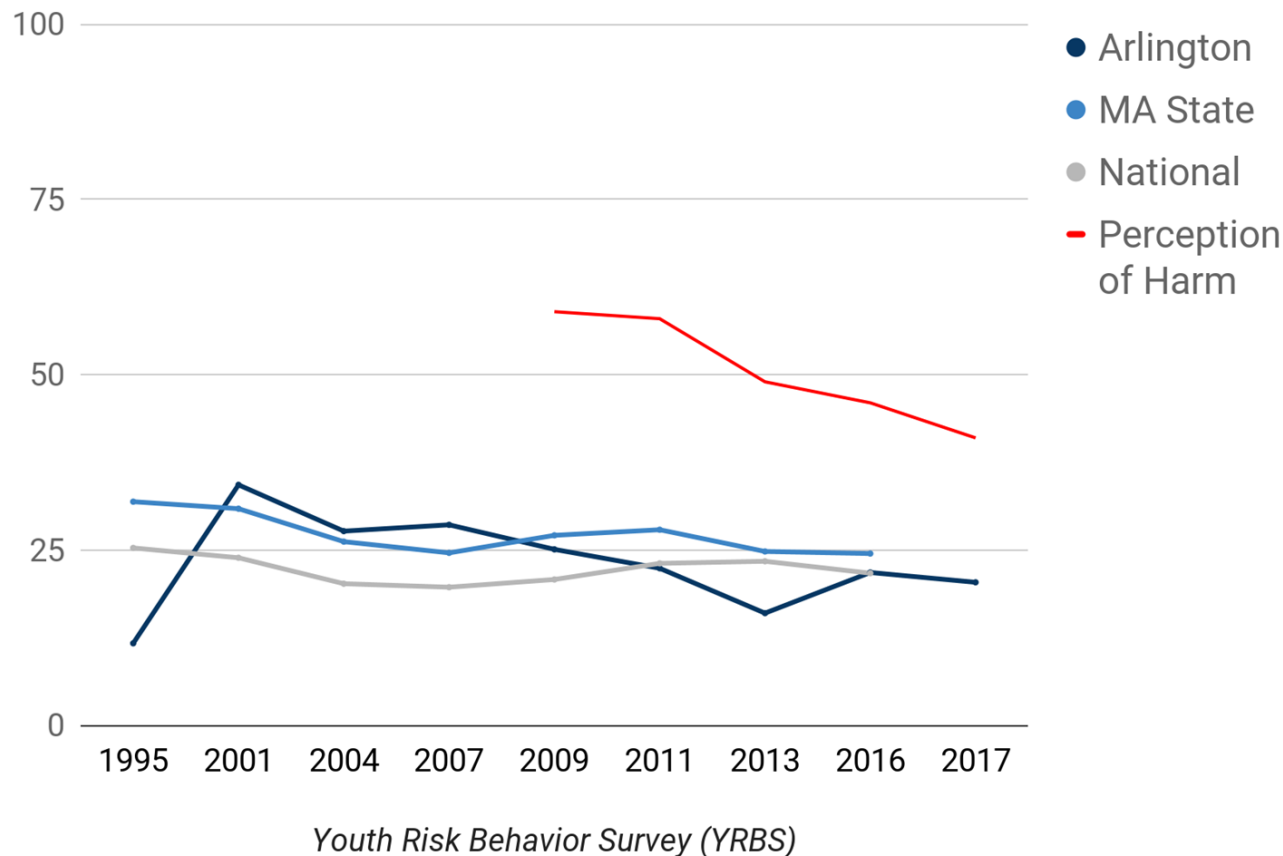
Overall, AHS students' **lifetime marijuana use** has decreased since 2009. However since 2013, students have reported an increase in use.

High School Student Reported Lifetime Marijuana Use (%)



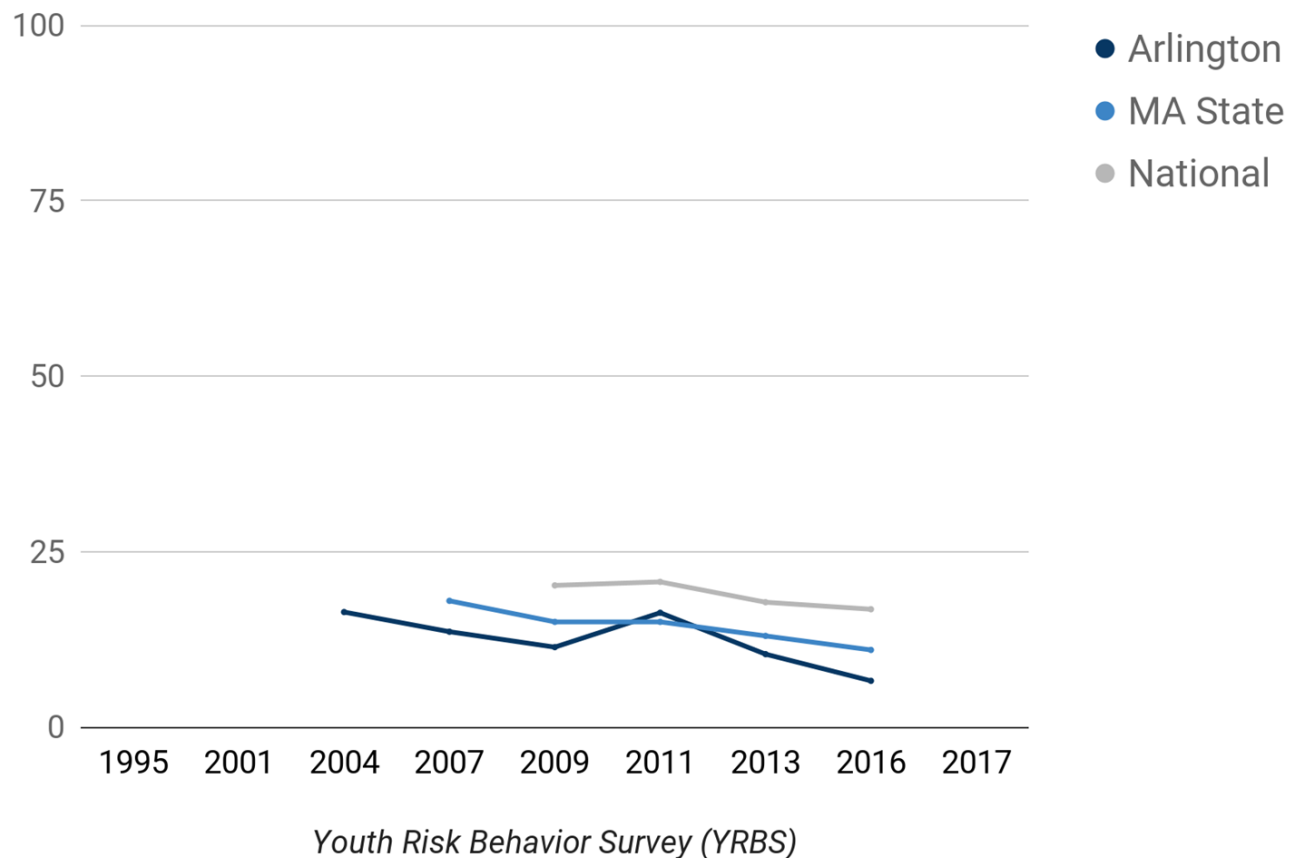
AHS students' recent (past 30-day) marijuana use has fluctuated throughout the past 20 years.

High School Student Reported Recent Marijuana Use (%)



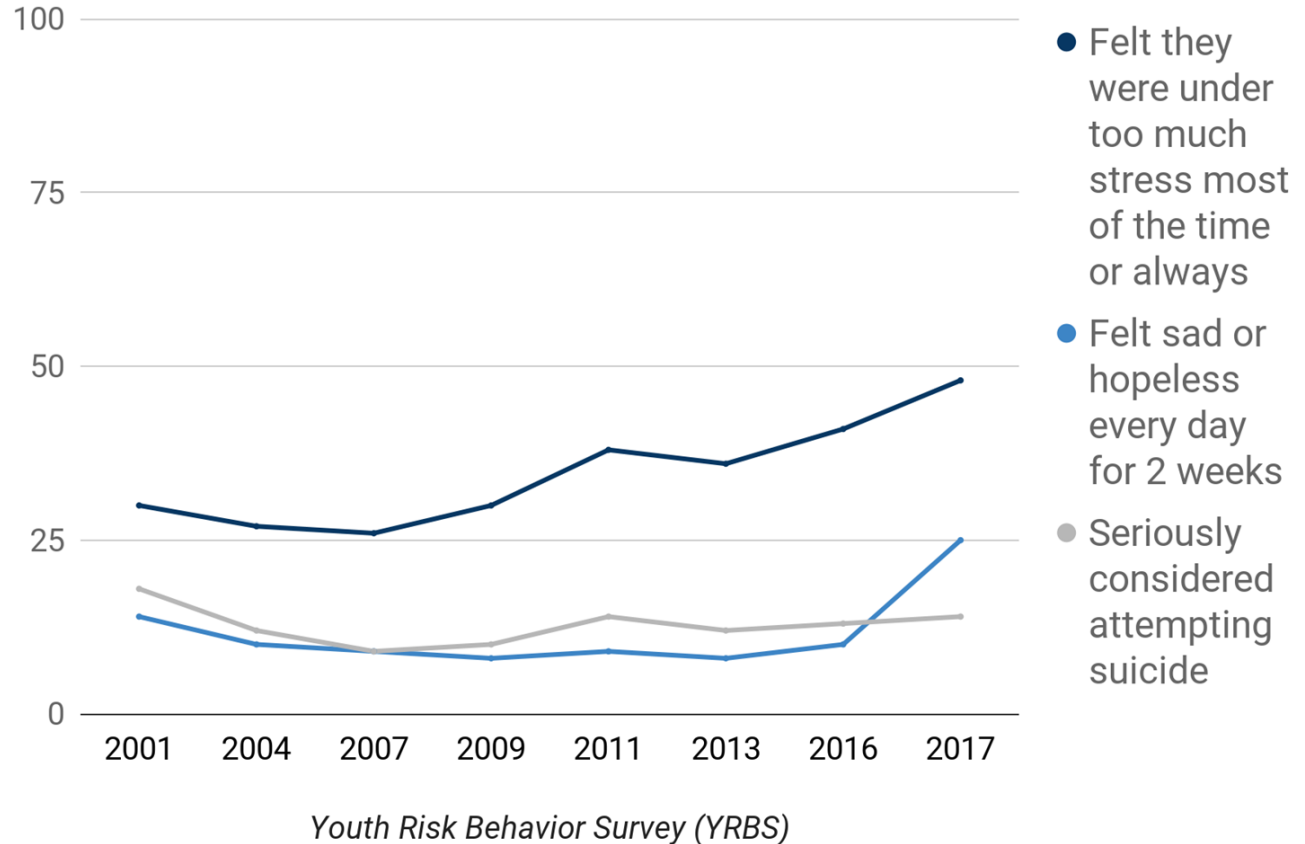
Reports of
prescription drug
misuse has been
steadily
decreasing
among high
school students
in Arlington, MA,
and the US.

High School Student Reported Lifetime Rx Drug Misuse (%)



Arlington High School students report an increase in thoughts of stress, depression and suicide.

Mental Health of AHS students (%)

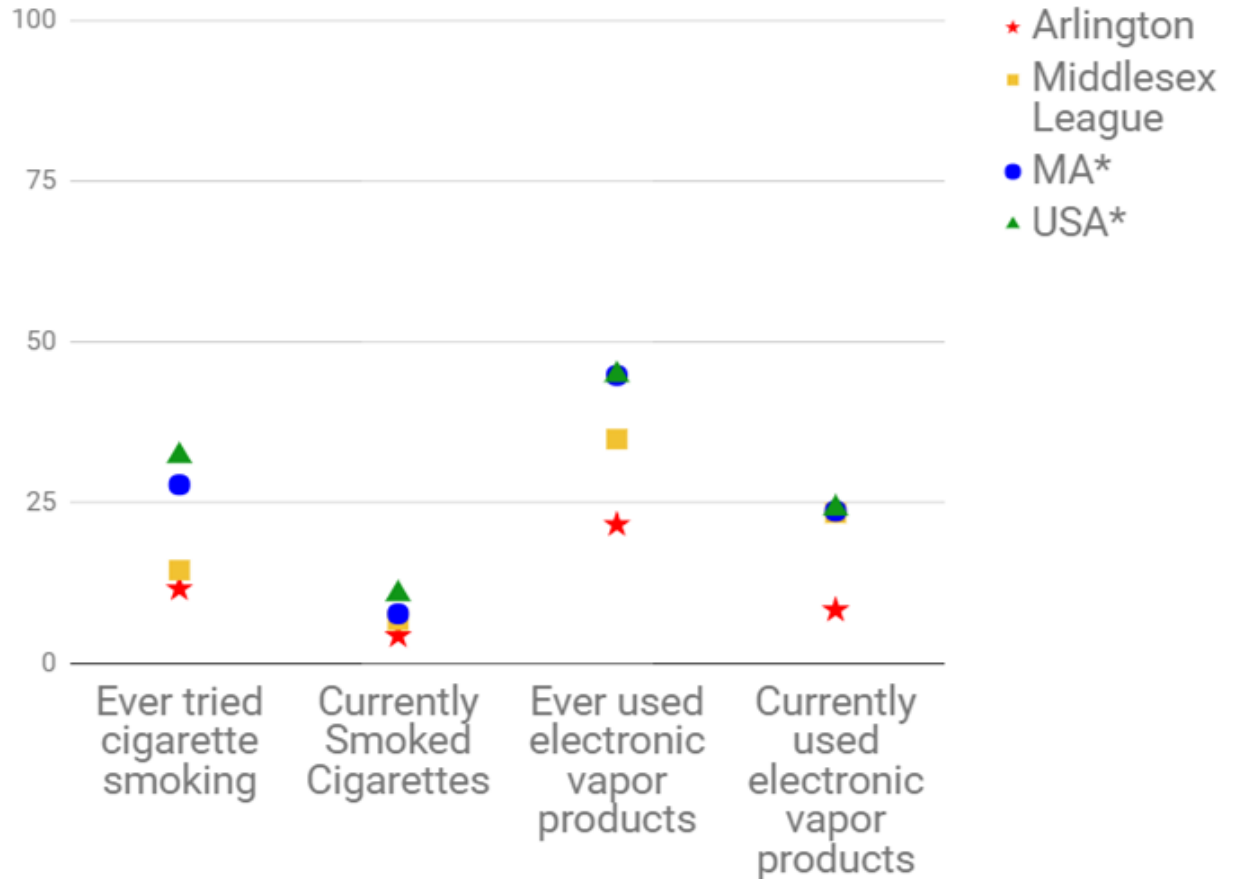


Middlesex League Data Comparisons

Arlington High School students reported **lower cigarette use** than students at Middlesex League schools, MA schools, and US schools.

Student Reported Tobacco/Cigarette Use (%), YRBS 2017

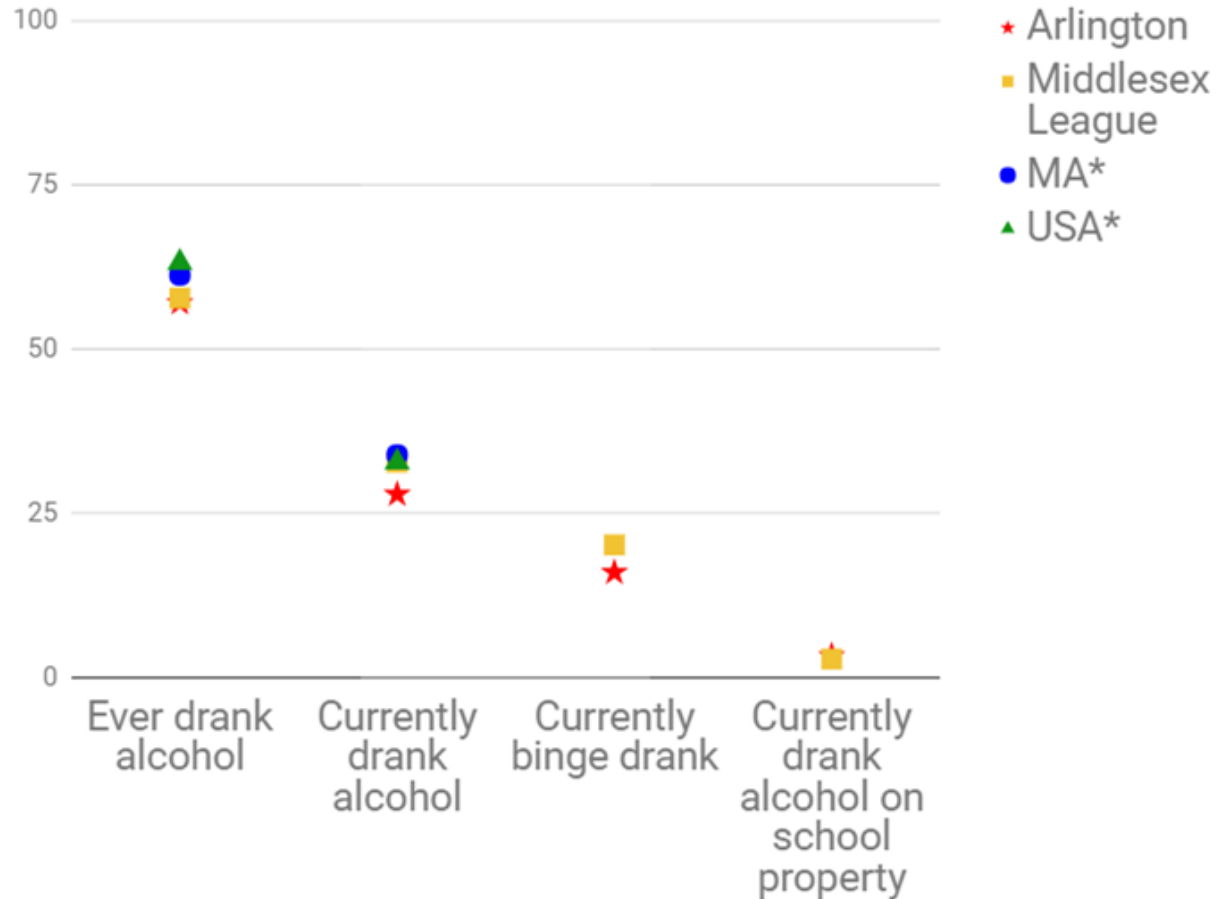
*2015 data



Arlington High School students reported **lower alcohol use** than students at Middlesex League schools, MA schools, and US schools.

Student Reported Alcohol Use (%), YRBS 2017

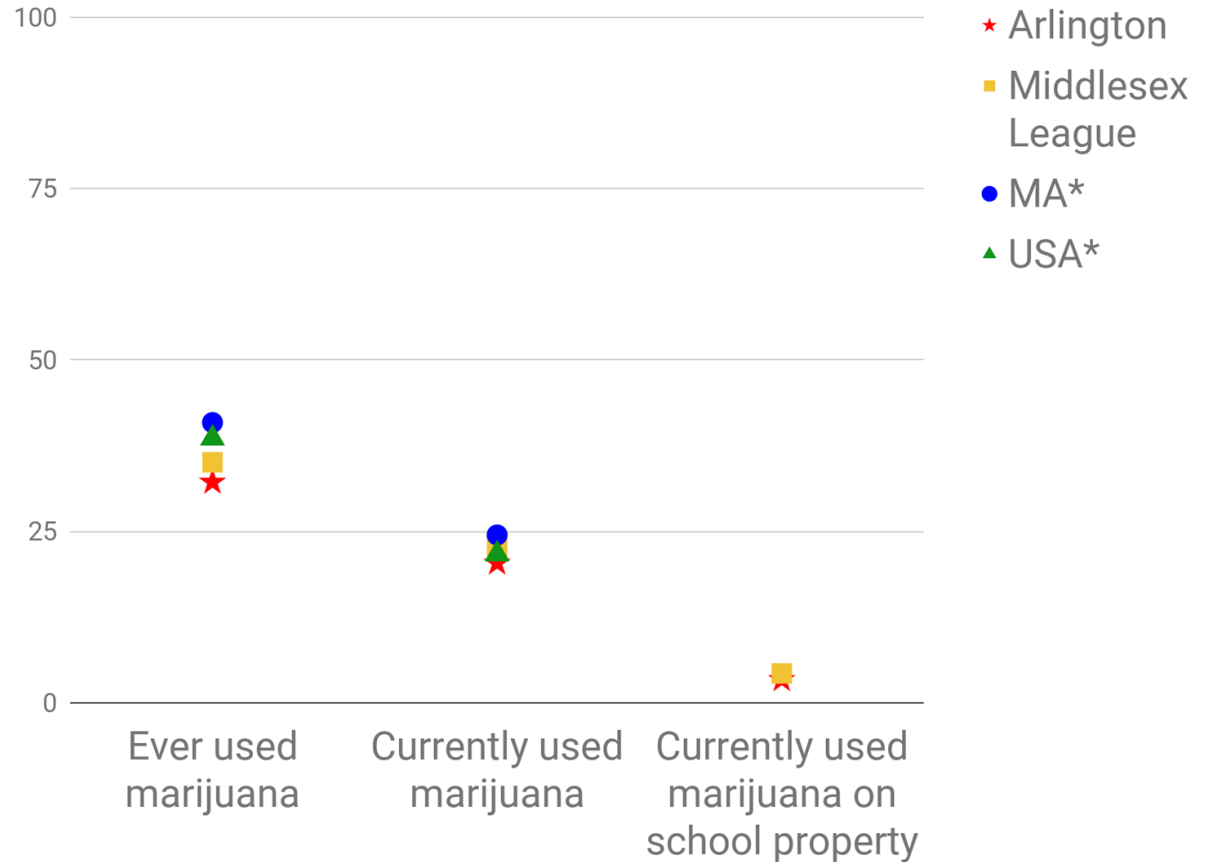
**2015 data*



Arlington High School students reported **lower marijuana use** than students in Middlesex League, MA and US schools.

Student Reported Marijuana Use (%), YRBS 2017

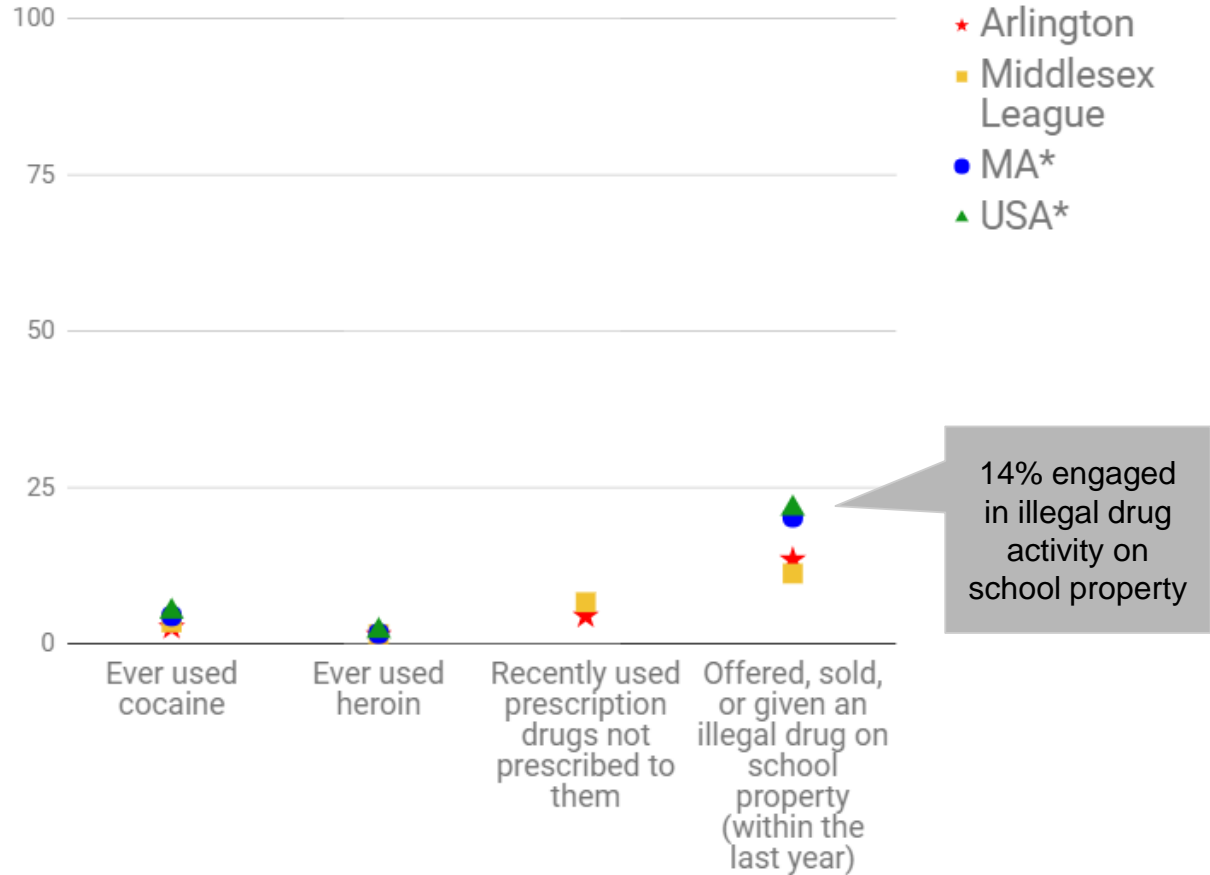
**2015 data*



Arlington High School students reported **similar rates of illegal drug use** as Middlesex League, MA, and US schools.

Student Reported Illegal Drug Use (%), YRBS 2017

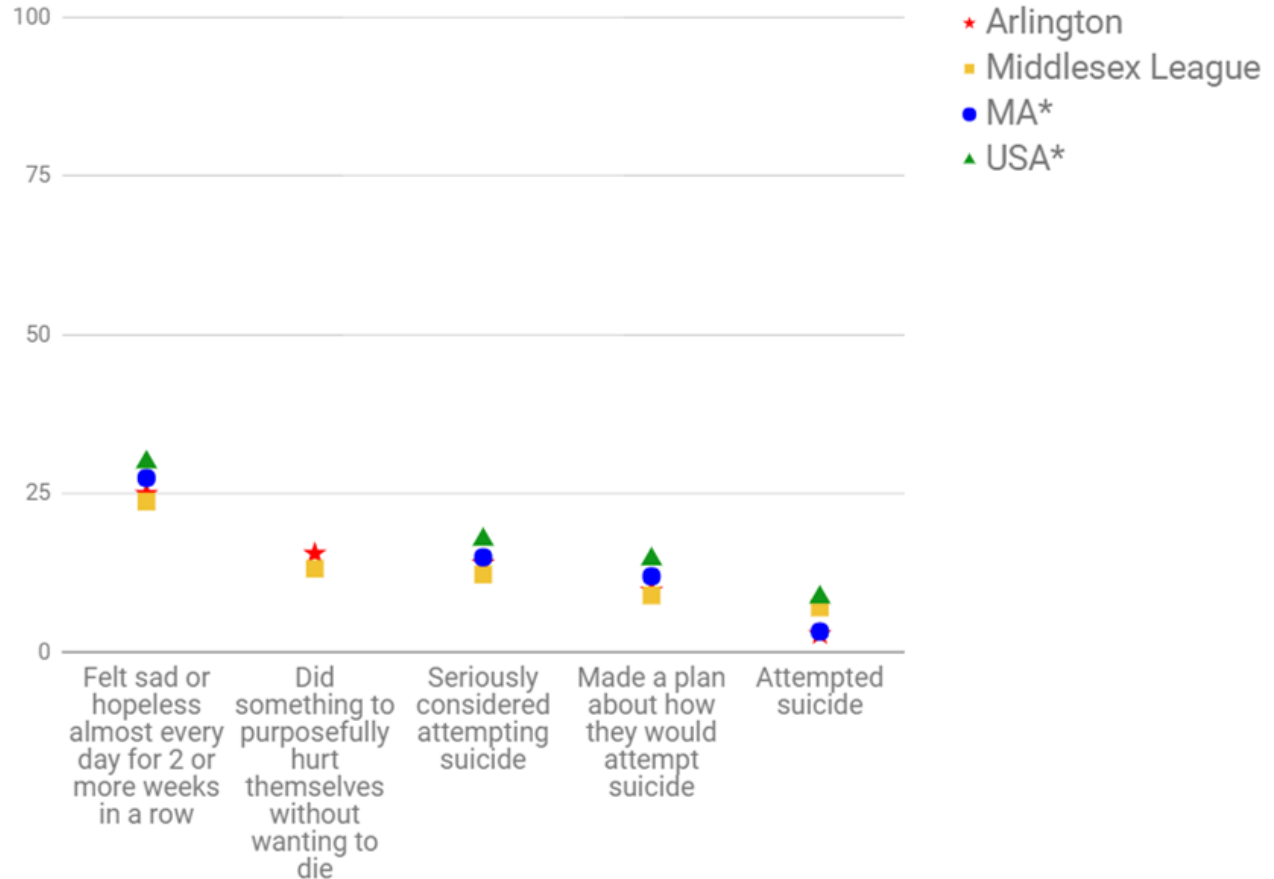
**2015 data*



Arlington High School students reported **higher mental health risk** than students at Middlesex League, but lower than students in MA & US schools.

Student Reported Mental Health Risk (%), YRBS 2017

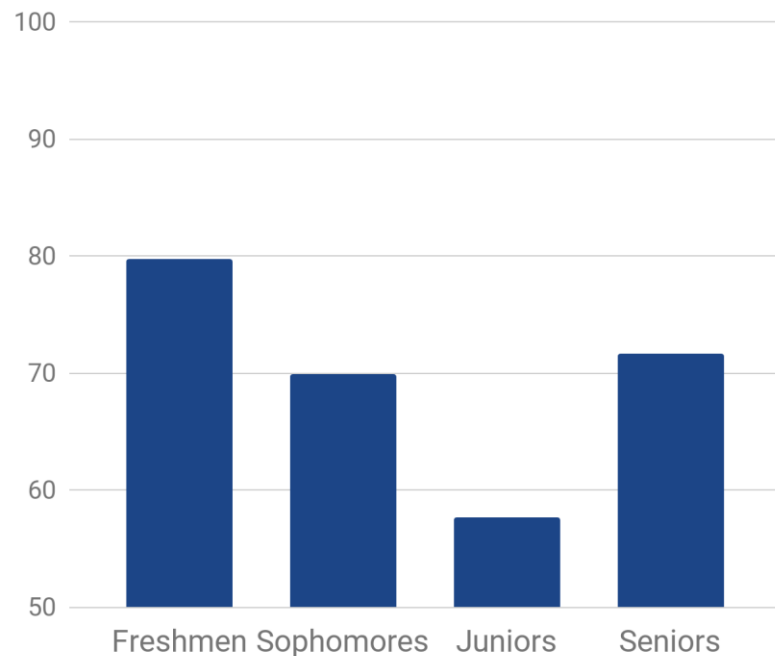
**2015 data*



68.6%

Of AHS students have at least one
teacher or other adult in their
school that they can talk to if they
have a problem

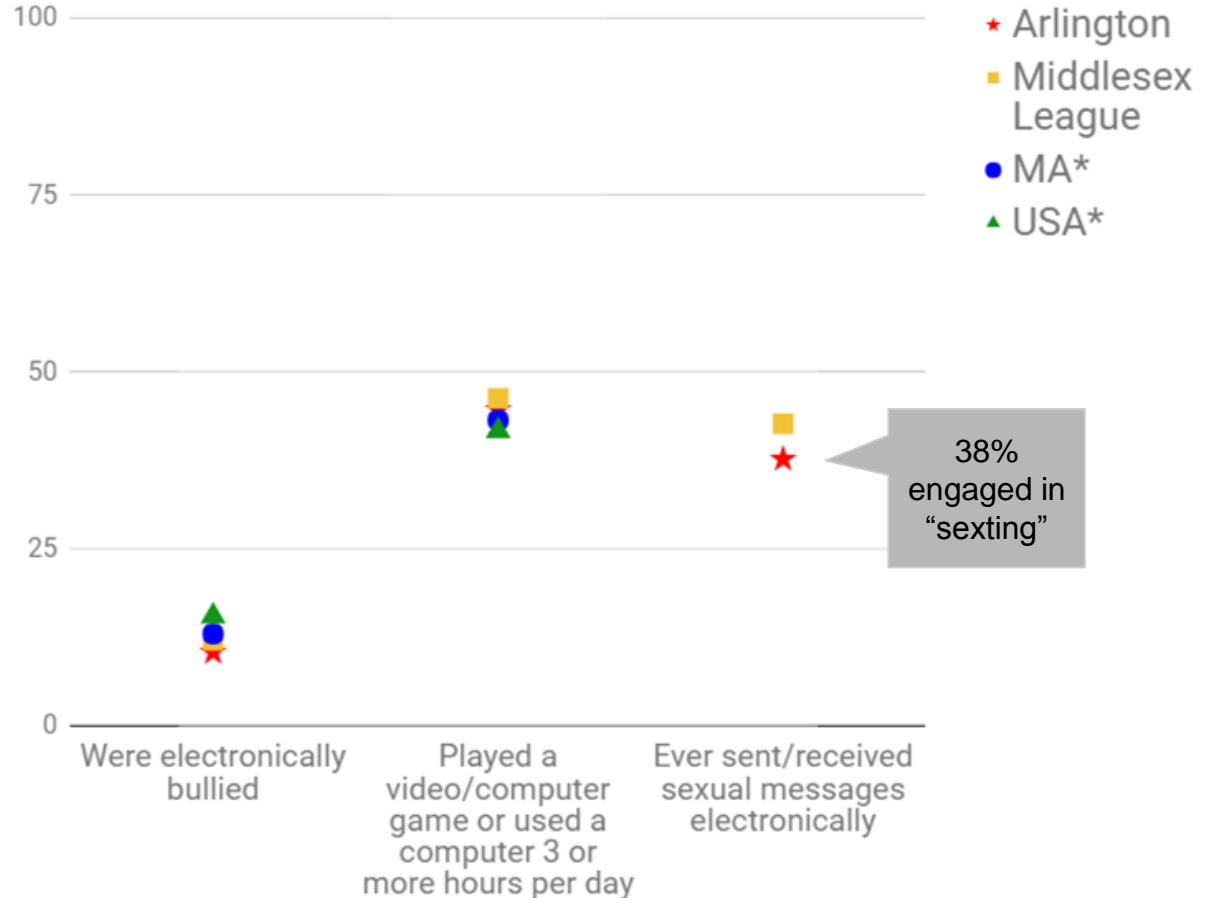
AHS Student Report of School Connection (%), YRBS 2017



AHS students reported lower electronic bullying and sexting rates, but similar screen time as students at Middlesex League, MA & US schools.

Student Reported Digital Behavior, YRBS 2017

**2015 data*



What's Happening Next?

- Botvin *LifeSkills Training* Curriculum at Ottoson | SEP 2017
- *Guiding Good Choices* parent workshop | OCT 2017
- SBIRT at Ottoson (grade 7) & AHS (grade 9) | NOV 2017
- AHS Wellness Day | DEC 2017
- Marijuana Community Forum | MAR 2018
- Michael Brandwein workshops at Ottoson | APR 2018



Town of Arlington, Massachusetts

Superintendent's Evaluation Process, J. Thielman

ATTACHMENTS:

Type	File Name	Description
Backup Material	Superintendent_Evaluation_Process_and_Procedures_(1st_Read)_(rev._1.21.17).pdf	Superintendent's Evaluation Process
Policy	cbi.pdf	Policy CBI

Superintendent Evaluation Process and Procedures (FY17)
Proposed by the Curriculum, Instruction, Assessment and Accountability Subcommittee
First Reading: January 26, 2017

Timeline and Policy Requirements

Per policy CBI, the annual evaluation cycle for the Superintendent is from July 1st through June 30th each year. The Superintendent has until September 30th to present evidence on the previous year's approved goals. The format for the evaluation of the Superintendent is defined in Policy CBI-E.

The consensus of the School Committee at its January 21, 2017 retreat was that the Committee should use the current "End-of-Cycle Summative Evaluation", Policy CBI-E, for FY17. The Policy and Procedures subcommittee, however, will be meeting to evaluate changes to Policy CBI-E for FY18.

At the retreat, the Committee agreed to have a presentation of the District's progress on all FY17 goals at a meeting in the early fall of 2017, prior to the Superintendent's evaluation. The presentation would inform School Committee members' evaluation of the Superintendent in November.

The Policy and Procedures subcommittee intends to meet to consider amending Policy BA-E, the Overarching Goals of the Arlington School Committee, to include a timeline by which a report on goals shall be presented to the School Committee by the Superintendent. The Committee also will consider amending Policy CBI to create a schedule by which the Superintendent presents her draft goals to the School Committee for approval.

Purpose of this memo

The purpose of this memo is to outline, per Policy CBI and CBI-E, the following criteria for the FY17 evaluation of Superintendent Kathleen Bodie:

- The Professional Practice, Student Learning and District Improvement Goals (Step 1 in Policy CBI-E) selected by the Superintendent and approved by the School Committee and the evidence required to show progress on each; and
- Evidence requested by the School Committee to evaluate the Superintendent on the four standards (Instructional Leadership, Management and Operations, Family and Community Engagement, and Professional Culture) in Step 2 of the current evaluation form (Policy CBI-E).

Step 1:

- **Professional Practice Goal**
 - By June 30, 2017, complete the physical design of the Gibbs School and complete a written summary of the process by which the district will develop an academic, extracurricular, and socio-emotional program, including an academic schedule, for the 6th Grade program at the Gibbs.
 - Evidence required:
 - The physical design plan

- List of meetings with the public and other stakeholders
 - Outline of the process by which the academic, extracurricular and socio-emotional program will be developed for the 6th grade program at Gibbs.
- **Student Learning Goal**
 - Written, refined vision and program for Arlington High School, ready for submission to the Massachusetts School Building Authority (MSBA).
 - Evidence required
 - Written vision statement and program plan for Arlington High School.
 - **District Improvement Goal**
 - Report on the completion of all documentation required in the Eligibility Period (modules 1-2) in the MSBA process for Arlington High School.
 - Evidence Required
 - Written report.

Step 2: Assess Superintendent's Performance on Standards

Following the same practice applied to our teachers, the School Committee has selected three pieces of evidence the Superintendent must present to show progress on each standard in Policy CBI-E:

- **Standard 1: Instructional Leadership**
 - Evidence, including standardized test scores, of the progress the district has made in closing the academic achievement gap in the Arlington Public Schools.
 - Report of the District's work in the MAPLE Consortium (The Massachusetts Personalized Learning Edtech Consortium) to further the growth of personalized learning in grades K-12 in Arlington.
 - Report of all common assessments administered in Arlington Public Schools in 2016-17. The report should include the subject and grade level of each common assessment.
- **Standard 2: Management and Operations**
 - Superintendent's budget and Town Meeting report.
 - Summary of the District's safety protocols.
 - Summary of onboarding procedures for new staff and guidelines for recruiting new teachers and staff.
- **Standard 3: Family and Community Engagement**
 - Schedule of workshops for parents sponsored by the district and parent forums for the Gibbs School design.
 - Parent-Teacher Conference Schedule

- Audit Report from the Massachusetts Department of Education (DESE) on English Language Learner, Special Education, and Civil Rights in the Arlington Public Schools.

- **Standard 4: Professional Culture**

- Written summary of the cultural proficiency professional development provided to administrators.
- School Committee members review of all communication, written and oral, by the Superintendent, including newsletters, memo, the budget presentation to Town Meeting, and any report associated with building and other projects.
- Report on the number of grievances with the School Department's collective bargaining units and whether those grievances were resolved or not. (Note: we are not requesting specific information about any grievance or the personnel involved). Also, a log of meetings scheduled with the AEA President, the Superintendent's Teacher Advisory Committee and the with AEA representatives to collaboratively discuss and work through issues of mutual interest as part of the negotiation process.

EVALUATION OF THE SUPERINTENDENT

The School Committee is responsible for the evaluation of the Superintendent.

The Superintendent's performance evaluation is incorporated into the District-wide goal setting and performance objective process described elsewhere in this policy manual. The annual evaluation cycle for the Superintendent shall be from July 1st through June 30th, with the following critical dates:

- By September 30th each year, the Superintendent shall present evidence of the progress made on the previous year's approved goals, including standards, indicators and elements the School Committee and Superintendent agreed to evaluate.
- By the second School Committee meeting in October each year, School Committee members shall complete in writing and present to the chairperson an End-of-Cycle Summative Evaluation Report on the Superintendent for the previous fiscal year (July 1 through June 30).
- At the first School Committee meeting in November, the School Committee shall, in open session, evaluate the Superintendent as specified below.
- By March 31st each year, the Superintendent shall present an interim report on the progress made on the goals agreed to the previous June.
- By May 15th each year, the School Committee shall approve the district's yearly goals for the upcoming fiscal year (July 1 through June 30).
- By June 30th each year, the Superintendent shall present his or her yearly goals to the School Committee for approval for the new fiscal year (July 1 through June 30), and the School Committee and the Superintendent shall agree by which standards, indicators and elements of the Model Rubric for Superintendents shall be measured for the next fiscal year.

At the first meeting in November each year, the School Committee shall conduct a formal evaluation in open session of the Superintendent. Each committee member will be invited to speak to each section of the evaluation instrument. The Chair has the discretion to institute a time limit for Committee members' remarks. At this meeting, the chair shall read and enter into the record a written End-of-Cycle Summative Evaluation Report, using the instrument developed by the state Department of Elementary and Secondary Education (DESE) that reflects the written evaluations of each member.

In addition to the written End-of-Cycle Summative Evaluation Report that each member must complete by the second meeting in October, any notes or written materials read or referred to in the public evaluation shall become part of the public record.

Committee members are urged to carefully consider the criteria and factors in the evaluation tool and to provide honest, objective feedback that is free of politics and personal agendas.

Approved and Revised: June 28, 2011 (September 12, 2013)



Town of Arlington, Massachusetts

8:40 PM Consent Agenda

Summary:

Approval of Minutes: School Committee Regular Meeting September 14, 2017

Approval of Warrant: Warrant # 18054 Total Amount \$627,226.94 dated September 14, 2017

ATTACHMENTS:

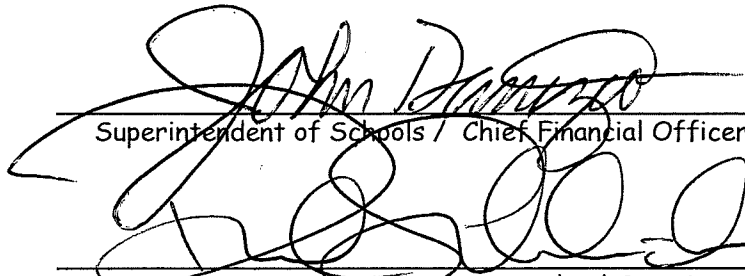
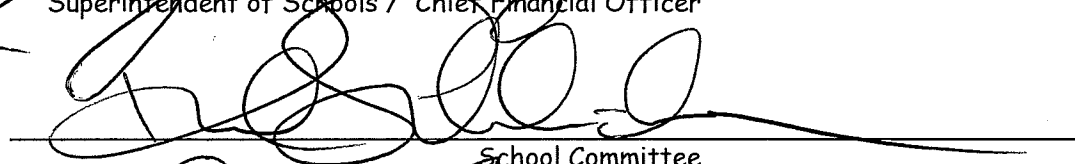
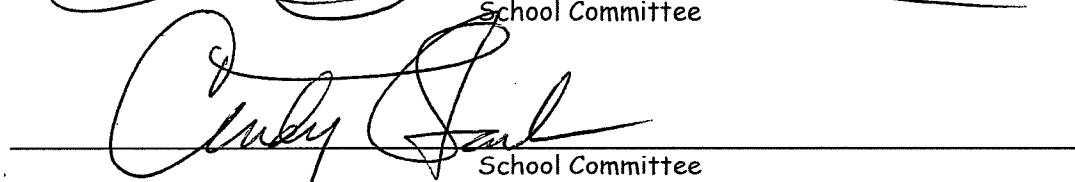
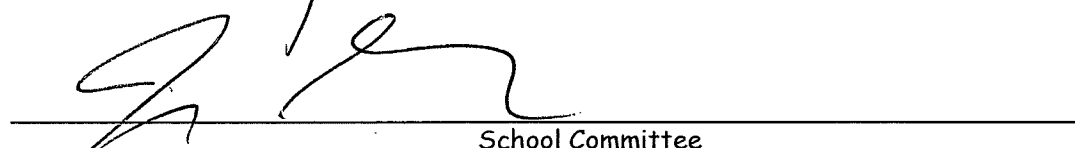

Type	File Name	Description
Warrant	warrant_18054_9_14_17.pdf	Warrant 9 14 2017 18054
Minutes	09_14_2017_School_Committee_Regular_Minutes_draft_final.docx	09 14 2017 School Committee Minutes

APPROVAL OF ACCOUNTS PAYABLE

I / We certify that there is due to the vendors named within this Accounts Payable Warrant the amount set against their respective names, in payment for services performed to date.

Warrant Number	18054	Total Warrant Amount	\$627,226.94
Dated	9/14/17		

STATEMENT MADE UNDER THE PENALTIES OF PERJURY

	Superintendent of Schools / Chief Financial Officer
	School Committee
	School Committee
	School Committee
	School Committee

09/14/2017 14:13
swalenski

TOWN OF ARLINGTON
PRELIMINARY

TOWN OF ARLINGTON

SC

P 1
apwarrrnt

DATE: 09/14/2017 WARRANT: 18054 AMOUNT: \$ 627,226.94

PAY TO EACH OF THE PERSONS NAMED IN THE ATTACHED WARRANT THE
SUMS SET AGAINST THEIR RESPECTIVE NAMES, AMOUNTING IN THE
AGGREGATE, AND CHARGE THE SAME TO APPROPRIATIONS OR ACCOUNTS
INDICATED.

TOWN MANAGER

COMPTROLLER

09/14/2017 14:13
swalenski

TOWN OF ARLINGTON
PRELIMINARY DETAIL INVOICE LIST

P 2
apwarrrnt

CASH ACCOUNT: 0000 104013 VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
31400 ABACS LLC		00000	7741618	INV	09/14/2017	MMLN17-17	293235		
1 02456821 83101 2320		SPED/CLINI	PROF TECH			1,317.22			
		Invoice Net				1,317.22			
						CHECK TOTAL	1,317.22		-----
31400 ABACS LLC		00000	7741818	INV	09/14/2017	RXRE17-17	293237		
1 02456821 83101 2320		SPED/CLINI	PROF TECH			100.50			
		Invoice Net				100.50			
31400 ABACS LLC		00000	7741918	INV	09/14/2017	AAVZ17-17	293240		
1 02456821 83101 2320		SPED/CLINI	PROF TECH			1,072.00			
		Invoice Net				1,072.00			
						CHECK TOTAL	1,172.50		-----
28030 ADMINISTRATIVE SOFTWAR		00000	11412618	INV	09/14/2017	18382	293728		
1 1336765 84201 6200		GEN ADMIN	OFFICE			1,000.00			
		Invoice Net				1,000.00			
28030 ADMINISTRATIVE SOFTWAR		00000	11412618	INV	09/14/2017	18650	293729		
1 1336765 84201 6200		GEN ADMIN	OFFICE			100.00			
		Invoice Net				100.00			
28030 ADMINISTRATIVE SOFTWAR		00000	11412618	INV	09/14/2017	18700	293730		
1 1336765 84201 6200		GEN ADMIN	OFFICE			1,000.00			
		Invoice Net				1,000.00			
28030 ADMINISTRATIVE SOFTWAR		00000	11412618	INV	09/14/2017	19027	293731		
1 1336765 84201 6200		GEN ADMIN	OFFICE			1,000.00			
		Invoice Net				1,000.00			
						CHECK TOTAL	3,100.00		-----
32432 AHOLD FINANCIAL SERVIC		00003	11369718	INV	09/14/2017	481514	292593		
1 15122260 84902 3520		HARDY GEN	HARDY FOOD			115.85			
		Invoice Net				115.85			
32432 AHOLD FINANCIAL SERVIC		00003	11370118	INV	09/14/2017	481513	292594		
1 15123260 84902 3520		AFT SCH	FOOD SUPPL			183.37			
		Invoice Net				183.37			
32432 AHOLD FINANCIAL SERVIC		00003	11370518	INV	09/14/2017	481507	292853		
1 15124145 84902 3520		THOMPSON	FOOD SUPPL			278.05			
		Invoice Net				278.05			
32432 AHOLD FINANCIAL SERVIC		00003	11369718	INV	09/14/2017	481508	293134		
1 15122260 84902 3520		HARDY GEN	HARDY FOOD			119.84			
		Invoice Net				119.84			
32432 AHOLD FINANCIAL SERVIC		00003	11370118	INV	09/14/2017	481509	293535		
1 15123260 84902 3520		AFT SCH	FOOD SUPPL			88.68			
		Invoice Net				88.68			
						CHECK TOTAL	785.79		-----
19606 ALL TRUCK AND EQUIPMEN		00000	7745318	INV	09/14/2017	97482	293253		
1 02816970 84802 3300		TRANS ED	VEHICLE RE			1,606.73			
		Invoice Net				1,606.73			

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TOWN OF ARLINGTON
PRELIMINARY DETAIL INVOICE LIST

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CASH ACCOUNT: 0000 104013 VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
						CHECK TOTAL	1,606.73		-----
31420	ANGELO,STEPHEN		00000	7763618 INV	09/14/2017	REIMB BUS PARTS 9/8	293493		
	1 02816970 84802	3300		TRANS ED VEHICLE RE		9.98			
				Invoice Net		9.98			
						CHECK TOTAL	9.98		-----
24592	ANN'S CHRISTIAN LEARNI		00000	7742018 INV	09/14/2017	APS-1006	293259		
	1 02456857 83101	2310		SPED CONTR PROF TECH		1,050.00			
				Invoice Net		1,050.00			
						CHECK TOTAL	1,050.00		-----
29770	ARISE CONSULTING SERVI		00001	7742118 INV	09/14/2017	CONSULT TB-AUG'17	293241		
	1 02456821 83101	2320		SPED/CLINI PROF TECH		590.00			
				Invoice Net		590.00			
29770	ARISE CONSULTING SERVI		00001	7742218 INV	09/14/2017	CONSULT NB-AUG'17	293243		
	1 02456821 83101	2320		SPED/CLINI PROF TECH		290.00			
				Invoice Net		290.00			
29770	ARISE CONSULTING SERVI		00001	7742318 INV	09/14/2017	CONSULT LC-AUG'17	293245		
	1 02456821 83101	2320		SPED/CLINI PROF TECH		590.00			
				Invoice Net		590.00			
29770	ARISE CONSULTING SERVI		00001	7742418 INV	09/14/2017	CONSULT ZF-AUG'17	293246		
	1 02456821 83101	2320		SPED/CLINI PROF TECH		350.00			
				Invoice Net		350.00			
29770	ARISE CONSULTING SERVI		00001	7742518 INV	09/14/2017	CONSULT DL-AUG'17	293247		
	1 02456821 83101	2320		SPED/CLINI PROF TECH		820.00			
				Invoice Net		820.00			
29770	ARISE CONSULTING SERVI		00001	7742618 INV	09/14/2017	CONSULT HRL-AUG'17	293248		
	1 02456821 83101	2320		SPED/CLINI PROF TECH		120.00			
				Invoice Net		120.00			
29770	ARISE CONSULTING SERVI		00001	7742718 INV	09/14/2017	CONSULT AT-AUG'17	293249		
	1 02456821 83101	2320		SPED/CLINI PROF TECH		930.00			
				Invoice Net		930.00			
29770	ARISE CONSULTING SERVI		00001	7742918 INV	09/14/2017	CONSULT PC-AUG'17	293250		
	1 02456821 83101	2320		SPED/CLINI PROF TECH		110.00			
				Invoice Net		110.00			
29770	ARISE CONSULTING SERVI		00001	7743018 INV	09/14/2017	CONSULT PG-AUG'17	293252		
	1 02456821 83101	2320		SPED/CLINI PROF TECH		180.00			
				Invoice Net		180.00			
						CHECK TOTAL	3,980.00		-----
70238	ARLINGTON CONTRIBUTORY		00000	11416717 INV	09/14/2017	RETIREMENT TITLE I	293534		
	1 0812017 81730	5100		TITLE I PENSIONS		5,392.41			
				Invoice Net		5,392.41			
						CHECK TOTAL	5,392.41		-----
74880	ARLINGTON SWIFTY PRINT		00000	11424718 INV	09/14/2017	139182	292595		

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TOWN OF ARLINGTON
PRELIMINARY DETAIL INVOICE LIST

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CASH ACCOUNT: 0000 104013 VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
	1 02606910 84201 1210	SUPER		OFFICE		214.79			
		Invoice Net				214.79			
74880	ARLINGTON SWIFTY PRINT	00000 11424718	INV	09/14/2017		139257	292596		
	1 02606910 84201 1210	SUPER		OFFICE		278.22			
		Invoice Net				278.22			
74880	ARLINGTON SWIFTY PRINT	00000 11364417	INV	09/14/2017		139260	292854		
	1 0772017 83404 2415	LANGUAGE		PRINTING		935.61			
		Invoice Net				935.61			
		CHECK TOTAL				1,428.62			-----
24394	AUDIOLOGY AND HEARING	00000 7743118	INV	09/14/2017		20353	293256		
	1 02456842 85110 2420	ADAPTIVE T		EQ INSTRUC		225.00			
		Invoice Net				225.00			
24394	AUDIOLOGY AND HEARING	00000 7743118	INV	09/14/2017		20360	293258		
	1 02456842 85110 2420	ADAPTIVE T		EQ INSTRUC		75.00			
		Invoice Net				75.00			
		CHECK TOTAL				300.00			-----
31703	CHARLES J BECKER & BRO	00000 11376418	INV	09/14/2017		1497539-IN	293135		
	1 02216506 85103 2415	ELEM EDUC		INSTRUCT		448.47			
		Invoice Net				448.47			
		CHECK TOTAL				448.47			-----
70412	BELMONT AND CRYSTAL SP	00001 706118	INV	09/14/2017		1249889 090117	293136		
	1 02606910 85806 1210	SUPER		MISC SUPPL		36.26			
		Invoice Net				36.26			
		CHECK TOTAL				36.26			-----
70412	BELMONT AND CRYSTAL SP	00001 7751318	INV	09/14/2017		14545241 090117	293260		
	1 02456800 84201 2430	PK-SPED		OFFICE		10.36			
		Invoice Net				10.36			
		CHECK TOTAL				10.36			-----
33732	BEST, TRINA	00000 11429918	INV	09/14/2017		REIMB SAMS CLUB EXP	293732		
	1 1336775 85103 6200	SUMMER FUN		INSTRUCT		177.98			
		Invoice Net				177.98			
33732	BEST, TRINA	00000 11429918	INV	09/14/2017		REIMB TARGET EXP	293734		
	1 1336775 85103 6200	SUMMER FUN		INSTRUCT		13.48			
		Invoice Net				13.48			
33732	BEST, TRINA	00000 11429918	INV	09/14/2017		REIMB SF EXP 8/7-8/8	293735		
	1 1336775 85103 6200	SUMMER FUN		INSTRUCT		149.80			
		Invoice Net				149.80			
		CHECK TOTAL				341.26			-----
32536	BLICK ART MATERIALS	00004 11368818	INV	09/14/2017		7972091	292856		
	1 02546750 85103 2415	VISUAL/ART		INSTRUCT		599.13			
		Invoice Net				599.13			

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CASH ACCOUNT: 0000

104013

VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
						CHECK TOTAL	599.13		-----
31887 BOOKSOURCE			00001 11373818	INV	09/14/2017	663486	292597		
1 02636915 85103 1220			CURRICULUM	INSTRUCT		478.79			
			Invoice Net			478.79			
31887 BOOKSOURCE			00001 11373818	INV	09/14/2017	668180	292598		
1 02636915 85103 1220			CURRICULUM	INSTRUCT		18.66			
			Invoice Net			18.66			
31887 BOOKSOURCE			00001 11375018	INV	09/14/2017	667715	292857		
1 02636915 85103 1220			CURRICULUM	INSTRUCT		34.38			
			Invoice Net			34.38			
31887 BOOKSOURCE			00001 11373518	INV	09/14/2017	670722	293737		
1 02096506 85103 2415			ELEM EDUC	INSTRUCT		603.32			
			Invoice Net			603.32			
						CHECK TOTAL	1,135.15		-----
22234 THE BOOK RACK			00001 11373118	INV	09/14/2017	813	293137		
1 02636915 85103 1220			CURRICULUM	INSTRUCT		1,980.00			
			Invoice Net			1,980.00			
22234 THE BOOK RACK			00001 11373218	INV	09/14/2017	814	293138		
1 02636915 85103 1220			CURRICULUM	INSTRUCT		1,595.80			
			Invoice Net			1,595.80			
						CHECK TOTAL	3,575.80		-----
18495 BOSTON HIGASHI SCHOOL			00000 7746418	INV	09/14/2017	1808412AR	293262		
1 02456851 83201 9300			OOD RESIDE	TUITION		9,359.37			
			Invoice Net			9,359.37			
18495 BOSTON HIGASHI SCHOOL			00000 7746718	INV	09/14/2017	1808403	293263		
1 02456851 83201 9300			OOD RESIDE	TUITION		18,718.73			
			Invoice Net			18,718.73			
						CHECK TOTAL	28,078.10		-----
23730 BROCCOLI HALL INC.			00000 7757418	INV	09/14/2017	8848	293265		
1 02456848 83201 9300			TUITION DY	TUITION		415.12			
			Invoice Net			415.12			
						CHECK TOTAL	415.12		-----
33734 BUS, AMBER			00000 11432818	INV	09/14/2017	REIMB SF 7/17-8/11	293738		
1 1336775 85103 6200			SUMMER FUN	INSTRUCT		215.17			
			Invoice Net			215.17			
33734 BUS, AMBER			00000 11432818	INV	09/14/2017	REIMB SF 7/17-7/27	293739		
1 1336775 85103 6200			SUMMER FUN	INSTRUCT		137.28			
			Invoice Net			137.28			
						CHECK TOTAL	352.45		-----
32387 BUTTERWORTH, ALISSA			00000 11430018	INV	09/14/2017	REIMB SF 7/22-8/1/17	293740		
1 1336775 85103 6200			SUMMER FUN	INSTRUCT		38.61			
			Invoice Net			38.61			

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CASH ACCOUNT: 0000

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WARRANT: 18054

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VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
						CHECK TOTAL	38.61		-----
70693	CAM OFFICE SERVICES, I	00000	11430818	INV	09/14/2017	109777	292599		
	1 02016507 84201 2430		SEC EDUC	OFFICE		520.57			
			Invoice Net			520.57			
70693	CAM OFFICE SERVICES, I	00000	11432318	INV	09/14/2017	110137	293741		
	1 02016507 85101 2430		SEC EDUC	REPRO SUPP		681.57			
			Invoice Net			681.57			
70693	CAM OFFICE SERVICES, I	00000	11432318	INV	09/14/2017	110106	293742		
	1 02016507 85101 2430		SEC EDUC	REPRO SUPP		71.42			
			Invoice Net			71.42			
						CHECK TOTAL	1,273.56		-----
70776	CARSON-DELLOSA PUBL	00002	11398918	INV	09/14/2017	918595	293536		
	1 02156506 85103 2415		ELEM EDUC	INSTRUCT		30.81			
			Invoice Net			30.81			
						CHECK TOTAL	30.81		-----
71176	D'AGOSTINO'S DELI	00001	11349918	INV	09/14/2017	12369	292858		
	1 02606575 84902 2357		MEMBERSHIP	FOOD SUPPL		115.00			
			Invoice Net			115.00			
71176	D'AGOSTINO'S DELI	00001	11349918	INV	09/14/2017	12372	292859		
	1 02606575 84902 2357		MEMBERSHIP	FOOD SUPPL		194.50			
			Invoice Net			194.50			
						CHECK TOTAL	309.50		-----
71277	DIDAX, INC.	00000	11268218	INV	09/14/2017	121680	292600		
	1 02396720 85103 2415		C&I MATH	INSTRUCT		1,005.76			
			Invoice Net			1,005.76			
						CHECK TOTAL	1,005.76		-----
71410	EDCO	00000	11293118	INV	09/14/2017	1181107	293139		
	1 02636575 87202 2357		PROF DEV	TRAINING		175.00			
			Invoice Net			175.00			
71410	EDCO	00000	11293118	INV	09/14/2017	1181120	293140		
	1 02636575 87202 2357		PROF DEV	TRAINING		105.00			
			Invoice Net			105.00			
						CHECK TOTAL	280.00		-----
17253	EDUCATION, INC.	00002	7744818	INV	09/14/2017	296021	293498		
	1 02456857 83101 2310		SPED CONTR	PROF TECH		837.50			
			Invoice Net			837.50			
						CHECK TOTAL	837.50		-----
29634	EXTRA PACKAGING LLC	00000	11399518	INV	09/14/2017	64191	293537		
	1 02156506 85103 2415		ELEM EDUC	INSTRUCT		145.00			
			Invoice Net			145.00			

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TOWN OF ARLINGTON
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CASH ACCOUNT: 0000 104013 VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
29634	EXTRA PACKAGING LLC	00000	11400518	INV	09/14/2017	64927	293538		
	1 02156506 85103 2415	ELEM EDUC	INSTRUCT			160.00			
		Invoice Net				160.00			
						CHECK TOTAL	305.00		-----
30300	FOLLETT SCHOOL SOLUTIO	00001	11396418	INV	09/14/2017	664201-3	293539		
	1 02486745 85106 2410	C&I SOC ST	TEXTBOOKS			430.85			
		Invoice Net				430.85			
30300	FOLLETT SCHOOL SOLUTIO	00001	11396418	INV	09/14/2017	664201A-2	293540		
	1 02486745 85106 2410	C&I SOC ST	TEXTBOOKS			152.10			
		Invoice Net				152.10			
30300	FOLLETT SCHOOL SOLUTIO	00001	11396418	INV	09/14/2017	664201F-2	293541		
	1 02486745 85106 2410	C&I SOC ST	TEXTBOOKS			307.04			
		Invoice Net				307.04			
						CHECK TOTAL	889.99		-----
75061	THE GUILD FOR HUMAN SE	00000	7756718	INV	09/14/2017	2163	293500		
	1 02456848 83201 9300	TUITION DY	TUITION			8,609.48			
		Invoice Net				8,609.48			
						CHECK TOTAL	8,609.48		-----
21209	GYM SERVICES, INC.	00000	11360218	INV	09/14/2017	170809-006	293744		
	1 02366548 83101 2440	HEALTH/H.S	PROF TECH			372.96			
		Invoice Net				372.96			
						CHECK TOTAL	372.96		-----
20160	HEINEMANN PROFESSIONAL	00002	11372518	INV	09/14/2017	6806138	292601		
	1 02636575 85103 2415	PROF DEV	INSTRUCT			3,136.06			
		Invoice Net				3,136.06			
20160	HEINEMANN PROFESSIONAL	00002	11374418	INV	09/14/2017	6807299	292602		
	1 02636575 85103 2415	PROF DEV	INSTRUCT			5,395.50			
		Invoice Net				5,395.50			
20160	HEINEMANN PROFESSIONAL	00002	11374918	INV	09/14/2017	6806181	292603		
	1 02636575 85103 2415	PROF DEV	INSTRUCT			2,316.25			
		Invoice Net				2,316.25			
20160	HEINEMANN PROFESSIONAL	00002	11374818	INV	09/14/2017	6806179	292604		
	1 02636575 85103 2415	PROF DEV	INSTRUCT			1,354.79			
		Invoice Net				1,354.79			
20160	HEINEMANN PROFESSIONAL	00002	11374618	INV	09/14/2017	6806178	293542		
	1 02636575 85103 2415	PROF DEV	INSTRUCT			5,395.50			
		Invoice Net				5,395.50			
20160	HEINEMANN PROFESSIONAL	00002	11398618	INV	09/14/2017	6800611	293543		
	1 02156506 85103 2415	ELEM EDUC	INSTRUCT			83.60			
		Invoice Net				83.60			
						CHECK TOTAL	17,681.70		-----
33693	HIGHROCK CHURCH INC.	00000	708118	INV	09/14/2017	23790	293141		

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CASH ACCOUNT: 0000 104013 VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
	1 02046960 88560	4220	ALTERNAT	SPACE RENT		3,000.00			
			Invoice Net			3,000.00			
						CHECK TOTAL	3,000.00		-----
33243	HOFFMAN, SIGALIT		00000	7762718	INV 09/14/2017	ASSESSMENT-EW	293509		
	1 02456860 83101	2800	SPED TEST	PROF TECH		1,500.00			
			Invoice Net			1,500.00			
						CHECK TOTAL	1,500.00		-----
33733	INGOLS, MARTHA A		00000	11430118	INV 09/14/2017	COVER ART 8/1/17	293745		
	1 1336765 83402	6200	GEN ADMIN	COMMUNICAT		250.00			
			Invoice Net			250.00			
						CHECK TOTAL	250.00		-----
33640	EILEEN CATIZONE		00000	11423118	INV 09/14/2017	PROMO FOR WORKSHp 4	293746		
	1 02636915 85103	1220	CURRICULUM	INSTRUCT		900.00			
			Invoice Net			900.00			
						CHECK TOTAL	900.00		-----
72363	LABBB COLLABORATIVE		00000	7762418	INV 09/14/2017	2181044	293267		
	1 02816980 83301	3300	SPED/REIMB	TRANS		969.00			
			Invoice Net			969.00			
72363	LABBB COLLABORATIVE		00000	7762318	INV 09/14/2017	2181035	293268		
	1 02816980 83301	3300	SPED/REIMB	TRANS		969.00			
			Invoice Net			969.00			
72363	LABBB COLLABORATIVE		00000	7762218	INV 09/14/2017	2181042	293271		
	1 02816980 83301	3300	SPED/REIMB	TRANS		918.00			
			Invoice Net			918.00			
72363	LABBB COLLABORATIVE		00000	7762118	INV 09/14/2017	2181045	293272		
	1 02816980 83301	3300	SPED/REIMB	TRANS		918.00			
			Invoice Net			918.00			
72363	LABBB COLLABORATIVE		00000	7759818	INV 09/14/2017	2181382	293273		
	1 02456860 83101	2720	SPED TEST	PROF TECH		224.40			
			Invoice Net			224.40			
72363	LABBB COLLABORATIVE		00000	7750218	INV 09/14/2017	2181282	293275		
	1 02456854 83201	9400	SPED/SUMME	TUITION		9,035.40			
			Invoice Net			9,035.40			
72363	LABBB COLLABORATIVE		00000	7750118	INV 09/14/2017	2181071	293278		
	1 02456854 83201	9400	SPED/SUMME	TUITION		5,301.72			
			Invoice Net			5,301.72			
72363	LABBB COLLABORATIVE		00000	7747618	INV 09/14/2017	2181056	293279		
	1 02456854 83201	9400	SPED/SUMME	TUITION		4,699.62			
			Invoice Net			4,699.62			
72363	LABBB COLLABORATIVE		00000	7750718	INV 09/14/2017	2181074	293281		
	1 02456854 83201	9400	SPED/SUMME	TUITION		4,699.62			
			Invoice Net			4,699.62			
72363	LABBB COLLABORATIVE		00000	7750318	INV 09/14/2017	2181073	293282		

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CASH ACCOUNT: 0000 104013 VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
	1 02456854 83201 9400			SPED/SUMME	TUITION	4,699.62			
				Invoice Net		4,699.62			
72363	LABBB COLLABORATIVE	00000	7750018	INV	09/14/2017	2181072	293283		
	1 02456854 83201 9400			SPED/SUMME	TUITION	5,301.72			
				Invoice Net		5,301.72			
72363	LABBB COLLABORATIVE	00000	7749818	INV	09/14/2017	2181069	293284		
	1 02456854 83201 9400			SPED/SUMME	TUITION	4,699.62			
				Invoice Net		4,699.62			
72363	LABBB COLLABORATIVE	00000	7749518	INV	09/14/2017	2181281	293285		
	1 02456854 83201 9400			SPED/SUMME	TUITION	9,035.40			
				Invoice Net		9,035.40			
72363	LABBB COLLABORATIVE	00000	7749318	INV	09/14/2017	2181066	293286		
	1 02456854 83201 9400			SPED/SUMME	TUITION	1,305.45			
				Invoice Net		1,305.45			
72363	LABBB COLLABORATIVE	00000	7749218	INV	09/14/2017	2181065	293288		
	1 02456854 83201 9400			SPED/SUMME	TUITION	5,301.72			
				Invoice Net		5,301.72			
72363	LABBB COLLABORATIVE	00000	7749018	INV	09/14/2017	2181063	293289		
	1 02456854 83201 9400			SPED/SUMME	TUITION	5,301.72			
				Invoice Net		5,301.72			
72363	LABBB COLLABORATIVE	00000	7748618	INV	09/14/2017	2181061	293290		
	1 02456854 83201 9400			SPED/SUMME	TUITION	4,699.62			
				Invoice Net		4,699.62			
72363	LABBB COLLABORATIVE	00000	7747918	INV	09/14/2017	2181059	293291		
	1 02456854 83201 9400			SPED/SUMME	TUITION	4,699.62			
				Invoice Net		4,699.62			
72363	LABBB COLLABORATIVE	00000	7748018	INV	09/14/2017	2181060	293292		
	1 02456854 83201 9400			SPED/SUMME	TUITION	5,301.72			
				Invoice Net		5,301.72			
72363	LABBB COLLABORATIVE	00000	7747818	INV	09/14/2017	2181058	293293		
	1 02456854 83201 9400			SPED/SUMME	TUITION	5,301.72			
				Invoice Net		5,301.72			
72363	LABBB COLLABORATIVE	00000	7747718	INV	09/14/2017	2181057	293295		
	1 02456854 83201 9400			SPED/SUMME	TUITION	5,301.72			
				Invoice Net		5,301.72			
72363	LABBB COLLABORATIVE	00000	7746218	INV	09/14/2017	2181273	293297		
	1 02816980 83301 3300			SPED/REIMB	TRANS	44,837.22			
				Invoice Net		44,837.22			
72363	LABBB COLLABORATIVE	00000	7748918	INV	09/14/2017	2181062	293298		
	1 02456854 83201 9400			SPED/SUMME	TUITION	4,699.62			
				Invoice Net		4,699.62			
72363	LABBB COLLABORATIVE	00000	7749918	INV	09/14/2017	2181070	293299		
	1 02456848 83201 9400			TUITION DY		602.10			
	2 02456854 83201 9400			SPED/SUMME	TUITION	4,699.62			
				Invoice Net		5,301.72			
CHECK TOTAL						143,522.97			-----

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PRELIMINARY DETAIL INVOICE LIST

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CASH ACCOUNT: 0000 104013 VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
72372	LAKESHORE LEARNING MAT	00001	11294318	INV	09/14/2017	5343890817	293142		
	1 02636575 85103 2415	PROF DEV		INSTRUCT		551.08			
		Invoice Net				551.08			
72372	LAKESHORE LEARNING MAT	00001	11375518	INV	09/14/2017	5099530817	293544		
	1 02216506 85103 2415	ELEM EDUC		INSTRUCT		94.74			
		Invoice Net				94.74			
72372	LAKESHORE LEARNING MAT	00001	11169518	INV	09/14/2017	1540040817	293545		
	1 02096506 85103 2415	ELEM EDUC		INSTRUCT		731.49			
		Invoice Net				731.49			
72372	LAKESHORE LEARNING MAT	00001	11399118	INV	09/14/2017	5078540817	293546		
	1 02156506 85103 2415	ELEM EDUC		INSTRUCT		112.90			
		Invoice Net				112.90			
72372	LAKESHORE LEARNING MAT	00001	11398418	INV	09/14/2017	5078590817	293547		
	1 02156506 85103 2415	ELEM EDUC		INSTRUCT		179.37			
		Invoice Net				179.37			
72372	LAKESHORE LEARNING MAT	00001	11398718	INV	09/14/2017	5078610817	293548		
	1 02156506 85103 2415	ELEM EDUC		INSTRUCT		120.40			
		Invoice Net				120.40			
		CHECK TOTAL				1,789.98			-----
19990	LATHAM CENTERS, INC	00000	7747118	INV	09/14/2017	034686	293300		
	1 02456851 83201 9300	OOD RESIDE		TUITION		19,731.50			
		Invoice Net				19,731.50			
		CHECK TOTAL				19,731.50			-----
72433	LEAGUE SCHOOL OF GREAT	00000	7747518	INV	09/14/2017	002420	293301		
	1 02456851 83201 9300	OOD RESIDE		TUITION		14,729.96			
		Invoice Net				14,729.96			
72433	LEAGUE SCHOOL OF GREAT	00000	7747518	INV	09/14/2017	002680	293508		
	1 02456845 83201 9300	OOD/AIDE		TUITION		1,120.50			
		Invoice Net				1,120.50			
		CHECK TOTAL				15,850.46			-----
33043	LEARN BY DOING, INC.	00002	11396618	INV	09/14/2017	002551	292605		
	1 02486745 85103 2415	C&I SOC ST		INSTRUCT		500.00			
		Invoice Net				500.00			
		CHECK TOTAL				500.00			-----
23564	LAZEL, INC.	00003	11373918	INV	09/14/2017	1818418	292860		
	1 02636575 85103 2415	PROF DEV		INSTRUCT		5,682.05			
		Invoice Net				5,682.05			
		CHECK TOTAL				5,682.05			-----
26138	MAHONEY, CHRISTOPHER	00000	11429018	INV	09/14/2017	REIMB SF 7/6-7/7/17	292606		
	1 1336775 85103 6200	SUMMER FUN		INSTRUCT		233.00			
		Invoice Net				233.00			
26138	MAHONEY, CHRISTOPHER	00000	11433018	INV	09/14/2017	REIMB SF DAY TRIPS	293747		

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CASH ACCOUNT: 0000 104013 VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
1	1336775 85103	6200		SUMMER FUN	INSTRUCT	144.49			
				Invoice Net		144.49			
						CHECK TOTAL		377.49	-----
72695	MASC (MA ASSO. SCHOOL	00001	11348618	INV	09/14/2017	2018000011	293549		
1	02576900 87202 1110			SCHOOL COM	TRAINING	200.00			
				Invoice Net		200.00			
						CHECK TOTAL		200.00	-----
72694	MA ASSOC OF SCHOOL SUP	00000	11425018	INV	09/14/2017	#E04-251-8540	293144		
1	02606910 87301 2357			SUPER	PROF AFFLI	650.00			
				Invoice Net		650.00			
						CHECK TOTAL		650.00	-----
12897	THE MAY INSTITUTE INC.	00001	7747218	INV	09/14/2017	663970	293303		
1	02456851 83201 9300			OOD RESIDE	TUITION	18,700.44			
				Invoice Net		18,700.44			
						CHECK TOTAL		18,700.44	-----
30302	MCSS	00003	11396818	INV	09/14/2017	DEPT.MEMBERSHIP	293143		
1	02486745 87301 2357			C&I SOC ST	PROF AFFLI	150.00			
				Invoice Net		150.00			
						CHECK TOTAL		150.00	-----
72955	MODERN SCH SUPPLY INC	00001	11402018	INV	09/14/2017	M0035140	292861		
1	02036507 85103 2415			SEC EDUC	INSTRUCT	162.77			
				Invoice Net		162.77			
						CHECK TOTAL		162.77	-----
24753	MURPHY, MAUREEN	00000	11402718	INV	09/14/2017	REIM PARKNG-POWR SCH	293748		
1	02636575 87202 2357			PROF DEV	TRAINING	196.00			
				Invoice Net		196.00			
						CHECK TOTAL		196.00	-----
73039	MUSIC IN MOTION	00000	11169018	INV	09/14/2017	00552437	292607		
1	02096506 85103 2415			ELEM EDUC	INSTRUCT	301.13			
				Invoice Net		301.13			
						CHECK TOTAL		301.13	-----
73056	ARLINGTON CENTER AUTO	00000	7745618	INV	09/14/2017	836608	293255		
1	02816970 84802 3300			TRANS ED	VEHICLE RE	74.95			
				Invoice Net		74.95			
						CHECK TOTAL		74.95	-----
33051	NASCO EDUCATION LLC	00001	11402518	INV	09/14/2017	557510	293145		
1	02036507 85103 2415			SEC EDUC	INSTRUCT	351.46			
				Invoice Net		351.46			

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CASH ACCOUNT: 0000

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VENDOR 8304

WARRANT: 18054

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VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
						CHECK TOTAL	351.46		-----
20455	NASHOBA LEARNING GROUP	00000	7751918	INV	09/14/2017	012675		293305	
	1 07506848 83201 9300		CB OOD DAY	TUITION		4,347.72			
			Invoice Net			4,347.72			
20455	NASHOBA LEARNING GROUP	00000	7751918	INV	09/14/2017	012894		293307	
	1 07506848 83201 9300		CB OOD DAY	TUITION		65.61			
			Invoice Net			65.61			
20455	NASHOBA LEARNING GROUP	00000	7759918	INV	09/14/2017	013068		293309	
	1 02456848 83201 9300		TUITION DY	TUITION		735.56			
			Invoice Net			735.56			
20455	NASHOBA LEARNING GROUP	00000	7759918	INV	09/14/2017	013201		293311	
	1 02456848 83201 9300		TUITION DY	TUITION		980.76			
			Invoice Net			980.76			
						CHECK TOTAL	6,129.65		-----
24772	NEW ENGLAND ACADEMY,LL	00000	7756418	INV	09/14/2017	ARL0817P		293313	
	1 02456848 83201 9300		TUITION DY	TUITION		2,500.40			
			Invoice Net			2,500.40			
24772	NEW ENGLAND ACADEMY,LL	00000	7756918	INV	09/14/2017	ARL0817		293315	
	1 02456848 83201 9300		TUITION DY	TUITION		2,500.40			
			Invoice Net			2,500.40			
						CHECK TOTAL	5,000.80		-----
31550	PEAR DECK, INC	00001	11293718	INV	09/14/2017	INV-1598		293749	
	1 02036507 85103 2415		SEC EDUC	INSTRUCT		2,500.00			
			Invoice Net			2,500.00			
						CHECK TOTAL	2,500.00		-----
15561	PEARSON EDUCATION	00001	11268518	INV	09/14/2017	7025834035		292608	
	1 02396720 85103 2415		C&I MATH	INSTRUCT		2,271.17			
			Invoice Net			2,271.17			
15561	PEARSON EDUCATION	00001	11268518	INV	09/14/2017	4025209241		292609	
	1 02396720 85103 2415		C&I MATH	INSTRUCT		2,053.20			
			Invoice Net			2,053.20			
15561	PEARSON EDUCATION	00001	11267818	INV	09/14/2017	4025165275		292862	
	1 02396720 85103 2415		C&I MATH	INSTRUCT		1,074.94			
			Invoice Net			1,074.94			
15561	PEARSON EDUCATION	00001	11267818	INV	09/14/2017	4025165341		292863	
	1 02396720 85103 2415		C&I MATH	INSTRUCT		8,010.37			
			Invoice Net			8,010.37			
15561	PEARSON EDUCATION	00001	11267818	INV	09/14/2017	7025777674		292864	
	1 02396720 85103 2415		C&I MATH	INSTRUCT		6,046.24			
			Invoice Net			6,046.24			
15561	PEARSON EDUCATION	00001	11267818	INV	09/14/2017	4025177330		292865	
	1 02396720 85103 2415		C&I MATH	INSTRUCT		3,961.55			
			Invoice Net			3,961.55			

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CASH ACCOUNT: 0000

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VENDOR 8304

WARRANT: 18054

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VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	4025177366	292866		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		6,259.00			
			Invoice Net			6,259.00			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	4025177402	292867		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		1,163.02			
			Invoice Net			1,163.02			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	4025177539	292868		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		2,297.43			
			Invoice Net			2,297.43			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	4025177578	292869		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		5,171.99			
			Invoice Net			5,171.99			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	4025177832	292870		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		5,552.45			
			Invoice Net			5,552.45			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	4025177638	292871		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		6,186.54			
			Invoice Net			6,186.54			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	7025792381	292872		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		8,646.11			
			Invoice Net			8,646.11			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	7025792745	292873		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		10,097.21			
			Invoice Net			10,097.21			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	7025792763	292874		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		9,190.27			
			Invoice Net			9,190.27			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	7025792814	292875		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		1,209.24			
			Invoice Net			1,209.24			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	7025792815	292876		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		10,278.59			
			Invoice Net			10,278.59			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	7025792882	292877		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		7,920.56			
			Invoice Net			7,920.56			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	7025792963	292878		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		9,794.89			
			Invoice Net			9,794.89			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	4025196691	292879		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		1,739.18			
			Invoice Net			1,739.18			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	4025196702	292880		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		1,594.25			
			Invoice Net			1,594.25			
15561	PEARSON EDUCATION		00001	11267818	INV 09/14/2017	4025196743	292881		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		1,666.71			
			Invoice Net			1,666.71			

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CASH ACCOUNT: 0000

104013

VENDOR 8304

WARRANT: 18054

09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
15561 PEARSON EDUCATION			00001 11267818	INV	09/14/2017	4025196759	292882		
1 02396720 85103	2415	C&I MATH	INSTRUCT			1,449.32			
		Invoice Net				1,449.32			
15561 PEARSON EDUCATION			00001 11267818	INV	09/14/2017	4025196738	292883		
1 02396720 85103	2415	C&I MATH	INSTRUCT			1,207.76			
		Invoice Net				1,207.76			
CHECK TOTAL						114,841.99			-----
73408 PERKINS SCHOOL FOR THE			00000 7757018	INV	09/14/2017	060113	293317		
1 02456848 83201	9300	TUITION DY	TUITION			13,284.40			
		Invoice Net				13,284.40			
73408 PERKINS SCHOOL FOR THE			00000 7747018	INV	09/14/2017	060059	293319		
1 02456851 83201	9300	OOD RESIDE	TUITION			26,568.80			
		Invoice Net				26,568.80			
73408 PERKINS SCHOOL FOR THE			00000 7746818	INV	09/14/2017	060011	293320		
1 02456851 83201	9300	OOD RESIDE	TUITION			29,762.40			
		Invoice Net				29,762.40			
73408 PERKINS SCHOOL FOR THE			00000 7757118	INV	09/14/2017	060118	293321		
1 02456848 83201	9300	TUITION DY	TUITION			10,872.00			
		Invoice Net				10,872.00			
73408 PERKINS SCHOOL FOR THE			00000 7757118	INV	09/14/2017	JULY 2017-AV	293322		
1 02456848 83201	9300	TUITION DY	TUITION			633.22			
		Invoice Net				633.22			
CHECK TOTAL						81,120.82			-----
31626 PHILBIN INSURANCE GROU			00000 708418	INV	09/14/2017	0996015-B	293146		
1 02576900 83807	1110	SCHOOL COM	INSURANCE			38,946.00			
		Invoice Net				38,946.00			
CHECK TOTAL						38,946.00			-----
13902 PITSCO, INC.			00001 11402218	INV	09/14/2017	686315-1	293750		
1 02036507 85103	2415	SEC EDUC	INSTRUCT			3,265.50			
		Invoice Net				3,265.50			
13902 PITSCO, INC.			00001 11402218	INV	09/14/2017	686315-2	293751		
1 02036507 85103	2415	SEC EDUC	INSTRUCT			43.00			
		Invoice Net				43.00			
CHECK TOTAL						3,308.50			-----
27958 PORTER, NATHAN			00000 11390317	INV	09/14/2017	NINJA'S 8/7-8/11/17	293147		
1 1336775 81112	6200	SUMMER FUN	TEACHER SA			1,500.00			
		Invoice Net				1,500.00			
CHECK TOTAL						1,500.00			-----
11409 PREMIER SCHOOL AGENDAS			00004 11366718	INV	09/14/2017	304500077317	293550		
1 1974 84000		HIGH SCHOO	MISC			884.00			
		Invoice Net				884.00			
CHECK TOTAL						884.00			-----

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CASH ACCOUNT: 0000 104013 VENDOR 8304

WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
73542	PRO-ED 1 02156506 85103	2415	00002 11399018	INV 09/14/2017 ELEM EDUC INSTRUCT Invoice Net		2656246 153.89 153.89	292610		
						CHECK TOTAL	153.89		-----
14467	REALLY GOOD STUFF, LLC 1 02216506 85103	2415	00000 11376018	INV 09/14/2017 ELEM EDUC INSTRUCT Invoice Net		6179640 32.94 32.94	292611		
14467	REALLY GOOD STUFF, LLC 1 02156506 85103	2415	00000 11399418	INV 09/14/2017 ELEM EDUC INSTRUCT Invoice Net		6085886 621.38 621.38	293551		
14467	REALLY GOOD STUFF, LLC 1 02156506 85103	2415	00000 11400418	INV 09/14/2017 ELEM EDUC INSTRUCT Invoice Net		6191743 152.58 152.58	293552		
14467	REALLY GOOD STUFF, LLC 1 02216506 85103	2415	00000 11375618	INV 09/14/2017 ELEM EDUC INSTRUCT Invoice Net		6174251 127.34 127.34	293553		
14467	REALLY GOOD STUFF, LLC 1 02156506 85103	2415	00000 11400618	INV 09/14/2017 ELEM EDUC INSTRUCT Invoice Net		6203727 176.10 176.10	293554		
14467	REALLY GOOD STUFF, LLC 1 02156506 85103	2415	00000 11361918	INV 09/14/2017 ELEM EDUC INSTRUCT Invoice Net		6089016 952.93 952.93	293555		
14467	REALLY GOOD STUFF, LLC 1 02156506 85103	2415	00000 11361918	INV 09/14/2017 ELEM EDUC INSTRUCT Invoice Net		6124741 37.60 37.60	293556		
						CHECK TOTAL	2,100.87		-----
23093	A. RUSSO & SONS, INC. 1 15122260 84902	3520	00000 11370218	INV 09/14/2017 HARDY GEN HARDY FOOD Invoice Net		383204 132.50 132.50	292612		
23093	A. RUSSO & SONS, INC. 1 15123260 84902	3520	00000 11370318	INV 09/14/2017 AFT SCH FOOD SUPPL Invoice Net		386534 118.25 118.25	293557		
23093	A. RUSSO & SONS, INC. 1 15122260 84902	3520	00000 11370218	INV 09/14/2017 HARDY GEN HARDY FOOD Invoice Net		387430 118.75 118.75	293558		
						CHECK TOTAL	369.50		-----
16760	SCHOLASTIC, INC. 1 02486745 85103	2415	00001 11318718	INV 09/14/2017 C&I SOC ST INSTRUCT Invoice Net		M6192269 6 329.67 329.67	293559		
16760	SCHOLASTIC, INC. 1 02486745 85103	2415	00001 11318818	INV 09/14/2017 C&I SOC ST INSTRUCT Invoice Net		M6192270 4 659.34 659.34	293560		
						CHECK TOTAL	989.01		-----

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TOWN OF ARLINGTON
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CASH ACCOUNT: 0000

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VENDOR 8304

WARRANT: 18054

09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
73185	SCHOOL SPECIALTY, INC.	00006	65001018	INV	09/14/2017	308102775153	292613		
	1 02096506 85103	2415	ELEM EDUC	INSTRUCT		285.70			
			Invoice Net			285.70			
73185	SCHOOL SPECIALTY, INC.	00006	65001218	INV	09/14/2017	308102843827	292614		
	1 02096506 85103	2415	ELEM EDUC	INSTRUCT		55.08			
			Invoice Net			55.08			
73185	SCHOOL SPECIALTY, INC.	00006	65001218	INV	09/14/2017	208119110013	292615		
	1 02096506 85103	2415	ELEM EDUC	INSTRUCT		44.21			
			Invoice Net			44.21			
73185	SCHOOL SPECIALTY, INC.	00006	65009618	INV	09/14/2017	308102834809	292616		
	1 02096506 85103	2415	ELEM EDUC	INSTRUCT		684.98			
			Invoice Net			684.98			
73185	SCHOOL SPECIALTY, INC.	00006	65016618	INV	09/14/2017	208118963895	292617		
	1 02396720 85103	2415	C&I MATH	INSTRUCT		546.24			
			Invoice Net			546.24			
73185	SCHOOL SPECIALTY, INC.	00006	65017518	INV	09/14/2017	308102847452	292618		
	1 15122260 85103	3520	HARDY GEN	HARDY GEN		753.55			
			Invoice Net			753.55			
73185	SCHOOL SPECIALTY, INC.	00006	65013918	INV	09/14/2017	308102854334	292884		
	1 02096506 85103	2415	ELEM EDUC	INSTRUCT		1,255.33			
			Invoice Net			1,255.33			
73185	SCHOOL SPECIALTY, INC.	00006	65001918	INV	09/14/2017	208118680057	292885		
	1 02096506 85103	2415	ELEM EDUC	INSTRUCT		89.00			
			Invoice Net			89.00			
73185	SCHOOL SPECIALTY, INC.	00006	65013818	INV	09/14/2017	308102856533	292886		
	1 0812017 87205	2310	TITLE I	YOUTH VILL		5,174.57			
			Invoice Net			5,174.57			
73185	SCHOOL SPECIALTY, INC.	00006	65011318	INV	09/14/2017	308102831423	292887		
	1 02216506 85103	2415	ELEM EDUC	INSTRUCT		224.33			
			Invoice Net			224.33			
73185	SCHOOL SPECIALTY, INC.	00006	65010418	INV	09/14/2017	308102841067	292888		
	1 02216506 85103	2415	ELEM EDUC	INSTRUCT		190.68			
			Invoice Net			190.68			
73185	SCHOOL SPECIALTY, INC.	00006	65011818	INV	09/14/2017	308102856448	292889		
	1 02216506 85103	2415	ELEM EDUC	INSTRUCT		154.41			
			Invoice Net			154.41			
73185	SCHOOL SPECIALTY, INC.	00006	65000518	INV	09/14/2017	208118586432	292890		
	1 02366548 85103	2415	HEALTH/H.S	INSTRUCT		42.74			
			Invoice Net			42.74			
73185	SCHOOL SPECIALTY, INC.	00006	65009118	INV	09/14/2017	308102852547	292891		
	1 02216506 85103	2415	ELEM EDUC	INSTRUCT		246.44			
			Invoice Net			246.44			
73185	SCHOOL SPECIALTY, INC.	00006	65008218	INV	09/14/2017	208118964543	292892		
	1 02216506 85103	2415	ELEM EDUC	INSTRUCT		76.11			
			Invoice Net			76.11			
73185	SCHOOL SPECIALTY, INC.	00006	65008118	INV	09/14/2017	308102824206	292893		
	1 02216506 85103	2415	ELEM EDUC	INSTRUCT		47.82			
			Invoice Net			47.82			

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WARRANT: 18054

09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
73185	SCHOOL SPECIALTY, INC.	00006	65007418	INV	09/14/2017	208118964558	292894		
	1 02216506 85103	2415	ELEM EDUC	INSTRUCT		32.29			
			Invoice Net			32.29			
73185	SCHOOL SPECIALTY, INC.	00006	65018218	INV	09/14/2017	208119109925	292895		
	1 02246506 85103	2415	ELEM EDUC	INSTRUCT		221.08			
			Invoice Net			221.08			
73185	SCHOOL SPECIALTY, INC.	00006	65005218	INV	09/14/2017	308102848973	292896		
	1 02246506 85103	2415	ELEM EDUC	INSTRUCT		141.41			
			Invoice Net			141.41			
73185	SCHOOL SPECIALTY, INC.	00006	65005218	INV	09/14/2017	208119153774	292897		
	1 02246506 85103	2415	ELEM EDUC	INSTRUCT		6.02			
			Invoice Net			6.02			
73185	SCHOOL SPECIALTY, INC.	00006	65011118	INV	09/14/2017	308102819424	293148		
	1 02036507 85103	2415	SEC EDUC	INSTRUCT		362.10			
			Invoice Net			362.10			
73185	SCHOOL SPECIALTY, INC.	00006	65014918	INV	09/14/2017	308102807159	293149		
	1 02036507 84201	2430	SEC EDUC	OFFICE		252.71			
			Invoice Net			252.71			
73185	SCHOOL SPECIALTY, INC.	00006	65014818	INV	09/14/2017	308102819649	293150		
	1 02036507 85103	2415	SEC EDUC	INSTRUCT		20,162.87			
			Invoice Net			20,162.87			
73185	SCHOOL SPECIALTY, INC.	00006	65018418	INV	09/14/2017	308102855044	293151		
	1 02036507 84201	2430	SEC EDUC	OFFICE		230.54			
			Invoice Net			230.54			
73185	SCHOOL SPECIALTY, INC.	00006	65017018	INV	09/14/2017	308102857041	293152		
	1 15122245 84201	3520	HARDY OFFI	HARDY OFFI		806.24			
			Invoice Net			806.24			
73185	SCHOOL SPECIALTY, INC.	00006	65004918	INV	09/14/2017	308102798730	293324		
	1 02456800 85103	2415	PK-SPED	INSTRUCT		5,718.67			
			Invoice Net			5,718.67			
73185	SCHOOL SPECIALTY, INC.	00006	65000918	INV	09/14/2017	208118585985	293608		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		8.37			
			Invoice Net			8.37			
73185	SCHOOL SPECIALTY, INC.	00006	65002018	INV	09/14/2017	208118699609	293610		
	1 02096506 85103	2415	ELEM EDUC	INSTRUCT		24.70			
			Invoice Net			24.70			
73185	SCHOOL SPECIALTY, INC.	00006	65002118	INV	09/14/2017	308102812188	293611		
	1 02156506 84201	2430	ELEM EDUC	OFFICE		1,937.23			
			Invoice Net			1,937.23			
73185	SCHOOL SPECIALTY, INC.	00006	65002318	INV	09/14/2017	208118787626	293613		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		377.92			
			Invoice Net			377.92			
73185	SCHOOL SPECIALTY, INC.	00006	65002518	INV	09/14/2017	308102803698	293616		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		263.59			
			Invoice Net			263.59			
73185	SCHOOL SPECIALTY, INC.	00006	65002918	INV	09/14/2017	308102798663	293617		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		401.61			
			Invoice Net			401.61			

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VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
73185	SCHOOL SPECIALTY, INC.	00006	65003018	INV	09/14/2017	208118787827	293619		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		38.40			
			Invoice Net			38.40			
73185	SCHOOL SPECIALTY, INC.	00006	65003218	INV	09/14/2017	308102798665	293621		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		342.92			
			Invoice Net			342.92			
73185	SCHOOL SPECIALTY, INC.	00006	65003318	INV	09/14/2017	308102798664	293623		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		630.24			
			Invoice Net			630.24			
73185	SCHOOL SPECIALTY, INC.	00006	65003418	INV	09/14/2017	308102798667	293624		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		180.67			
			Invoice Net			180.67			
73185	SCHOOL SPECIALTY, INC.	00006	65003518	INV	09/14/2017	308102812228	293625		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		1,181.03			
			Invoice Net			1,181.03			
73185	SCHOOL SPECIALTY, INC.	00006	65003618	INV	09/14/2017	308102798668	293626		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		706.65			
			Invoice Net			706.65			
73185	SCHOOL SPECIALTY, INC.	00006	65003718	INV	09/14/2017	308102789519	293627		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		1,263.96			
			Invoice Net			1,263.96			
73185	SCHOOL SPECIALTY, INC.	00006	65005518	INV	09/14/2017	308102789770	293628		
	1 02246506 85103	2415	ELEM EDUC	INSTRUCT		1,426.38			
			Invoice Net			1,426.38			
73185	SCHOOL SPECIALTY, INC.	00006	65006418	INV	09/14/2017	308102804226	293629		
	1 02246506 85103	2415	ELEM EDUC	INSTRUCT		199.41			
			Invoice Net			199.41			
73185	SCHOOL SPECIALTY, INC.	00006	65008518	INV	09/14/2017	308102836950	293630		
	1 02216506 85103	2415	ELEM EDUC	INSTRUCT		216.25			
			Invoice Net			216.25			
73185	SCHOOL SPECIALTY, INC.	00006	65014318	INV	09/14/2017	308102834866	293631		
	1 02246506 85103	2415	ELEM EDUC	INSTRUCT		148.56			
			Invoice Net			148.56			
73185	SCHOOL SPECIALTY, INC.	00006	65017318	INV	09/14/2017	208119044323	293632		
	1 02246506 85103	2415	ELEM EDUC	INSTRUCT		4.47			
			Invoice Net			4.47			
73185	SCHOOL SPECIALTY, INC.	00006	65017418	INV	09/14/2017	308102851869	293634		
	1 02246506 85103	2415	ELEM EDUC	INSTRUCT		294.54			
			Invoice Net			294.54			
73185	SCHOOL SPECIALTY, INC.	00006	65017818	INV	09/14/2017	208119166729	293635		
	1 02246506 85103	2415	ELEM EDUC	INSTRUCT		584.96			
			Invoice Net			584.96			
73185	SCHOOL SPECIALTY, INC.	00006	65018018	INV	09/14/2017	208119072643	293636		
	1 02156506 85103	2415	ELEM EDUC	INSTRUCT		318.80			
			Invoice Net			318.80			
73185	SCHOOL SPECIALTY, INC.	00006	65020818	INV	09/14/2017	208119189918	293752		
	1 02096506 84201	2430	ELEM EDUC	OFFICE		785.58			
			Invoice Net			785.58			

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VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
						CHECK TOTAL	49,141.36		-----
32381	SCHOOLHOUSE DESIGNS		00001 11398318	INV	09/14/2017	73117	293561		
	1 02156506 85103 2415		ELEM EDUC INSTRUCT			75.79			
			Invoice Net			75.79			
						CHECK TOTAL	75.79		-----
31480	SHRED-IT US JV LLC		00003 11292918	INV	09/14/2017	8123063009	293562		
	1 02606910 83101 1210		SUPER PROF TECH			1,277.13			
			Invoice Net			1,277.13			
						CHECK TOTAL	1,277.13		-----
27662	THINK SOCIAL PUBLISHIN		00000 11333518	INV	09/14/2017	71245	293325		
	1 0962017 85103 2357		SPED IMPRO SUPPLIES			945.05			
			Invoice Net			945.05			
27662	THINK SOCIAL PUBLISHIN		00000 11361318	INV	09/14/2017	68265	293563		
	1 02156506 85106 2410		ELEM EDUC TEXTBOOKS			269.94			
			Invoice Net			269.94			
						CHECK TOTAL	1,214.99		-----
20759	SUCCESS BY DESIGN, INC		00000 11361217	INV	09/14/2017	158362	293564		
	1 02156506 85103 2415		ELEM EDUC INSTRUCT			381.94			
			Invoice Net			381.94			
						CHECK TOTAL	381.94		-----
74145	TEACHER CREATED MATERI		00000 11376518	INV	09/14/2017	2197423	292898		
	1 02216506 85106 2410		ELEM EDUC TEXTBOOKS			94.27			
			Invoice Net			94.27			
74145	TEACHER CREATED MATERI		00000 9907818	INV	09/14/2017	2197425	293565		
	1 02156506 85106 2410		ELEM EDUC TEXTBOOKS			50.59			
			Invoice Net			50.59			
						CHECK TOTAL	144.86		-----
74166	TERC		00001 11278718	INV	09/14/2017	#00757549331D	293153		
	1 02216575 87202 2357		PROF DEV TRAINING			500.00			
			Invoice Net			500.00			
						CHECK TOTAL	500.00		-----
22736	THURSTON FOODS, INC.		00000 11370918	INV	09/14/2017	776139	292899		
	1 15122260 84902 3520		HARDY GEN HARDY FOOD			763.07			
			Invoice Net			763.07			
22736	THURSTON FOODS, INC.		00000 11370818	INV	09/14/2017	777882	293154		
	1 15123260 84902 3520		AFT SCH FOOD SUPPL			484.10			
			Invoice Net			484.10			
						CHECK TOTAL	1,247.17		-----
20728	TRICON SPORTS		00001 11394918	INV	09/14/2017	15875	292900		

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WARRANT: 18054 09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
	1 02026630 85104	3510		ATHL/SOCCE	ATHL SUPPL	547.80			
	2 02026644 85104	3510		ATH/G/SOCC	ATHL SUPPL	547.81			
				Invoice Net		1,095.61			
20728	TRICON SPORTS		00001 11408918	INV	09/14/2017	16129	292901		
	1 02026620 85104	3510		ATHLE/ADMI	ATHL SUPPL	1,474.25			
				Invoice Net		1,474.25			
				CHECK TOTAL		2,569.86			-----
33670	TURNING TECH, LLC		00000 11397018	INV	09/14/2017	359926-IN	293155		
	1 02486745 85103	2415		C&I SOC ST	INSTRUCT	99.00			
				Invoice Net		99.00			
				CHECK TOTAL		99.00			-----
18592	JOSEPH VAUTOUR		00000 11424618	INV	09/14/2017	REIM ENDORSEMNT COR	293753		
	1 02636575 87106	2357		PROF DEV	Grad Cours	470.00			
				Invoice Net		470.00			
				CHECK TOTAL		470.00			-----
13234	W. B. MASON CO., INC.		00001 707418	INV	09/14/2017	I46575270	292619		
	1 02606910 88501	1210		SUPER	CAP EQUIP	50.83			
				Invoice Net		50.83			
13234	W. B. MASON CO., INC.		00001 705318	INV	09/14/2017	I47132913	292620		
	1 02666920 84201	1410		BUS OFFICE	OFFICE	.87			
				Invoice Net		.87			
13234	W. B. MASON CO., INC.		00001 11350018	INV	09/14/2017	I47212820	292621		
	1 02606910 84201	1210		SUPER	OFFICE	10.48			
				Invoice Net		10.48			
13234	W. B. MASON CO., INC.		00001 11375418	INV	09/14/2017	I46996670	292902		
	1 02216506 85101	2430		ELEM EDUC	REPRO SUPP	1,271.60			
				Invoice Net		1,271.60			
13234	W. B. MASON CO., INC.		00001 11375418	INV	09/14/2017	I46953260	292903		
	1 02216506 85101	2430		ELEM EDUC	REPRO SUPP	354.54			
				Invoice Net		354.54			
13234	W. B. MASON CO., INC.		00001 613618	INV	09/14/2017	I47308313	292904		
	1 02696925 84201	1410		PAYROLL	OFFICE	17.99			
				Invoice Net		17.99			
13234	W. B. MASON CO., INC.		00001 11350018	INV	09/14/2017	I47306333	292905		
	1 02606910 84201	1210		SUPER	OFFICE	61.58			
				Invoice Net		61.58			
13234	W. B. MASON CO., INC.		00001 11431418	INV	09/14/2017	I47364811	293156		
	1 02016507 84201	2430		SEC EDUC	OFFICE	813.75			
				Invoice Net		813.75			
13234	W. B. MASON CO., INC.		00001 7746118	INV	09/14/2017	I46267080	293326		
	1 02456806 84201	2430		SPED ADM M	OFFICE	57.64			
				Invoice Net		57.64			
13234	W. B. MASON CO., INC.		00001 11350018	INV	09/14/2017	I47403564	293566		
	1 02606910 84201	1210		SUPER	OFFICE	28.50			
				Invoice Net		28.50			

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CASH ACCOUNT: 0000

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VENDOR 8304

WARRANT: 18054

09/14/2017

VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
13234 W. B. MASON CO., INC.		00001	11431418	INV	09/14/2017	I47406732	293569		
1	02016507 84201 2430	SEC EDUC	OFFICE			1,593.34			
		Invoice Net				1,593.34			
13234 W. B. MASON CO., INC.		00001	11399218	INV	09/14/2017	I46358669	293570		
1	02156506 85101 2430	ELEM EDUC	REPRO SUPP			27.55			
		Invoice Net				27.55			
13234 W. B. MASON CO., INC.		00001	11399218	INV	09/14/2017	I46268006	293571		
1	02156506 85101 2430	ELEM EDUC	REPRO SUPP			32.35			
		Invoice Net				32.35			
13234 W. B. MASON CO., INC.		00001	11399218	INV	09/14/2017	I46226133	293572		
1	02156506 84201 2430	ELEM EDUC	OFFICE			484.29			
2	02156506 85101 2430	ELEM EDUC	REPRO SUPP			912.96			
		Invoice Net				1,397.25			
13234 W. B. MASON CO., INC.		00001	11400218	INV	09/14/2017	I47041998	293574		
1	02156506 84201 2430	ELEM EDUC	OFFICE			399.98			
		Invoice Net				399.98			
13234 W. B. MASON CO., INC.		00001	11396918	INV	09/14/2017	I47228539	293576		
1	02486745 84201 2430	C&I SOC ST	OFFICE			26.26			
		Invoice Net				26.26			
13234 W. B. MASON CO., INC.		00001	705318	INV	09/14/2017	I47501932	293756		
1	02666920 84201 1410	BUS OFFICE	OFFICE			37.19			
		Invoice Net				37.19			
		CHECK TOTAL				6,181.70			-----
18262 WALL, MEREDITH		00000	11432918	INV	09/14/2017	REIMB SF 7/8-8/7/17	293754		
1	1336775 85103 6200	SUMMER FUN	INSTRUCT			529.74			
		Invoice Net				529.74			
		CHECK TOTAL				529.74			-----
74519 WEST MUSIC COMPANY		00001	11169118	INV	09/14/2017	SI1478640	292622		
1	02096506 85103 2415	ELEM EDUC	INSTRUCT			47.95			
		Invoice Net				47.95			
74519 WEST MUSIC COMPANY		00001	12278918	INV	09/14/2017	SI1471114	292906		
1	02216506 85103 2415	ELEM EDUC	INSTRUCT			83.38			
		Invoice Net				83.38			
		CHECK TOTAL				131.33			-----
74560 WILSON LANGUAGE TRAINI		00001	11372818	INV	09/14/2017	1686623	292623		
1	02636575 85103 2415	PROF DEV	INSTRUCT			4,229.28			
		Invoice Net				4,229.28			
74560 WILSON LANGUAGE TRAINI		00001	11373418	INV	09/14/2017	1688719	293157		
1	02636915 85103 1220	CURRICULUM	INSTRUCT			261.36			
		Invoice Net				261.36			
		CHECK TOTAL				4,490.64			-----
30031 DR EILEEN WOODS		00000	11402818	INV	09/14/2017	REIMB FILE FOLDERS	293755		
1	02036507 84201 2430	SEC EDUC	OFFICE			264.98			
		Invoice Net				264.98			

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CASH ACCOUNT: 0000

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WARRANT: 18054

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VENDOR	G/L ACCOUNTS	R	PO	TYPE	DUE DATE	INVOICE/AMOUNT	DOCUMENT	VOUCHER	CHECK
						CHECK TOTAL	264.98	-----	
=====						=====			
261 INVOICES						WARRANT TOTAL	627,226.94	627,226.94	
=====						=====			

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TOWN OF ARLINGTON
PRELIMINARY WARRANT SUMMARY

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WARRANT: 18054 09/14/2017

FUND	ORG	ACCOUNT	AMOUNT	AVLB BUDGET
0200	02016507	SECONDARY EDUCATIO	2,927.66	-545.06
0200	02016507	SECONDARY EDUCATIO	752.99	-4,377.27
0200	02026620	ATHLETICS/ADMIN	1,474.25	.00
0200	02026630	ATHLETICS/BOYS SOC	547.80	.00
0200	02026644	ATHLETICS/GIRLS SO	547.81	.00
0200	02036507	SECONDARY EDUCATIO	748.23	2,820.64
0200	02036507	SECONDARY EDUCATIO	26,847.70	-616.11
0200	02046960	ALTERNATIVE SCHOOL	3,000.00	.00
0200	02096506	ELEMENTARY EDUCATI	785.58	2,989.00
0200	02096506	ELEMENTARY EDUCATI	4,122.89	-1,907.24
0200	02156506	ELEMENTARY EDUCATI	2,821.50	-2,277.97
0200	02156506	ELEMENTARY EDUCATI	972.86	1,860.07
0200	02156506	ELEMENTARY EDUCATI	9,098.45	-1,466.38
0200	02156506	ELEMENTARY EDUCATI	320.53	708.70
0200	02216506	ELEMENTARY EDUCATI	1,626.14	-2,434.41
0200	02216506	ELEMENTARY EDUCATI	1,975.20	5,085.44
0200	02216506	ELEMENTARY EDUCATI	94.27	-369.66
0200	02216575	PROFESSIONAL DEVEL	500.00	-2,516.00
0200	02246506	ELEMENTARY EDUCATI	3,026.83	-2,190.48
0200	02366548	HEALTH/WEELLNESS H.	372.96	.00
0200	02366548	HEALTH/WEELLNESS H.	42.74	.00
0200	02396720	C&I MATH	116,393.99	-59,806.06
0200	02456800	PK-SPED	10.36	-160.89
0200	02456800	PK-SPED	5,718.67	1,268.39
0200	02456806	SPED ADM MGMT SERV	57.64	791.73
0200	02456821	SPED/CLINICAL SUPE	6,469.72	.00
0200	02456842	ADAPTIVE TECHNOLOGY	300.00	813.45
0200	02456845	OUT-OF-DISTRICT/ON	1,120.50	.00
0200	02456848	OUT OF DISTRICT TU	40,531.34	285,873.09
0200	02456848	OUT OF DISTRICT TU	602.10	535,825.64
0200	02456851	OUT OF DISTRICT RE	137,571.20	.00
0200	02456854	SPED SUMMER SCHOOL	94,085.25	.00
0200	02456857	SPED CONTRACTED SE	1,887.50	22,283.39
0200	02456860	SPED TESTING ASSES	224.40	-39,691.33
0200	02456860	SPED TESTING ASSES	1,500.00	13,149.72
0200	02486745	C&I SOCIAL STUDIES	26.26	657.93
0200	02486745	C&I SOCIAL STUDIES	1,588.01	2,263.07
0200	02486745	C&I SOCIAL STUDIES	889.99	-5,623.39
0200	02486745	C&I SOCIAL STUDIES	150.00	143.00
0200	02546750	VISUAL/PERF ARTS S	599.13	.00
0200	02576900	SCHOOL COMMITTEE	38,946.00	-100.00
0200	02576900	SCHOOL COMMITTEE	200.00	-369.50
0200	02606575	PROF AFFILIATIONS/	309.50	.00
0200	02606910	SUPERINTENDENT	1,277.13	-25,954.09
0200	02606910	SUPERINTENDENT	593.57	818.80
0200	02606910	SUPERINTENDENT	36.26	358.23
0200	02606910	SUPERINTENDENT	650.00	-10,119.00
0200	02606910	SUPERINTENDENT	50.83	.00
0200	02636575	PROF DEV/ASSISTANT	28,060.51	.00

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TOWN OF ARLINGTON
PRELIMINARY WARRANT SUMMARY

P 24
apwarrnt

WARRANT: 18054 09/14/2017

FUND ORG	ACCOUNT	AMOUNT	AVLB BUDGET
0200 02636575	PROF DEV/ASSISTANT 0200-3-63 -6575-34-09-9-00-87106 -2357	Graduate Course Reimbu 470.00	.00
0200 02636575	PROF DEV/ASSISTANT 0200-3-63 -6575-34-09-9-00-87202 -2357	TRAINING EDUC CONF & A 476.00	.00
0200 02636915	ASSISTANT SUPER OF 0200-3-63 -6915-34-09-9-00-85103 -1220	INSTRUCTIONAL MATERIAL 5,268.99	.00
0200 02666920	BUSINESS OFFICE 0200-3-66 -6920-01-24-9-07-84201 -1410	OFFICE SUPPLIES 38.06	4,097.89
0200 02696925	PAYROLL 0200-3-69 -6925-01-64-9-00-84201 -1410	OFFICE SUPPLIES 17.99	980.83
0200 02816970	TRANSPORTATION REG 0200-3-81 -6970-49-10-9-00-84802 -3300	MOTOR VEHICLE REPAIR 1,691.66	22,223.57
0200 02816980	SPED/MILEAGE REIMB 0200-3-81 -6980-36-02-9-00-83301 -3300	CONTRACTED TRANSPORTAT 48,611.22	.00
FUND TOTAL		599,030.17	
0750 07506848	CB OOD DAY NON PUB 0750-3-45 -6848-45-2 -9-NM-83201 -9300	CD OOD DAY NON PUBLIC 4,413.33	-2,360,198.00
FUND TOTAL		4,413.33	
0770 0772017	LANGUAGE INSTRUCTI 0770-3-2300-2017-45-03-9-NM-83404 -2415	REPRODUCTION/PRINTING 935.61	.00
FUND TOTAL		935.61	
0810 0812017	TITLE I DISTRIBUTI 0810-3-1000-2017-45-36-3-NM-81730 -5100	PENSIONS 5,392.41	.00
0810 0812017	TITLE I DISTRIBUTI 0810-3-1000-2017-45-36-3-NM-87205 -2310	YOUTH VILLAGES GERMAIN 5,174.57	30,267.69
FUND TOTAL		10,566.98	
0960 0962017	SPED IMPROVEMENT G 0960-3-2300-2017-45-23-9-NM-85103 -2357	SUPPLIES & MATERIALS 945.05	10,556.65
FUND TOTAL		945.05	
1330 1336765	COMM ED GENERAL AD 1330-3-2731-6765-01-40-7-NM-83402 -6200	COMMUNICATIONS 250.00	-23,140.58
1330 1336765	COMM ED GENERAL AD 1330-3-2731-6765-01-40-7-NM-84201 -6200	OFFICE SUPPLIES 3,100.00	-19,820.27
1330 1336775	COMM ED SUMMER FUN 1330-3-2731-6775-01-40-7-NM-81112 -6200	INSTRUCTIONAL SALARIES 1,500.00	107,080.73
1330 1336775	COMM ED SUMMER FUN 1330-3-2731-6775-01-40-7-NM-85103 -6200	INSTRUCTIONAL SUPPLIES 1,639.55	-11,184.69
FUND TOTAL		6,489.55	
1512 15122245	HARDY OFFICE SUPPL 1512-3-2300-0025-15-4 -3-NM-84201 -3520	HARDY OFFICE SUPPLIES 806.24	.00
1512 15122260	HARDY GENERAL SUPP 1512-3-2300-0025-15-5 -3-NM-84902 -3520	HARDY FOOD 1,250.01	-18,195.74
1512 15122260	HARDY GENERAL SUPP 1512-3-2300-0025-15-5 -3-NM-85103 -3520	HARDY GENERAL SUPPLIES 753.55	-6,412.65
1512 15123260	THOMPSON AFTER SCH 1512-3-2300-OR -15-6 -3-NM-84902 -3520	THOMPSON FOOD SUPPLIES 874.40	-16,314.26
1512 15124145	OTTOSON 1512-3-24 -OR -24-9 -3-NM-84902 -3520	FOOD SUPPLIES 278.05	-141,820.09
FUND TOTAL		3,962.25	
1974 1974	HIGH SCHOOL PRINCI 1974-3-01 -OR -01-10-5-NM-84000 -	MISC 884.00	-19.06
FUND TOTAL		884.00	

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WARRANT SUMMARY TOTAL	627,226.94
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TOWN OF ARLINGTON
PRELIMINARY WARRANT SUMMARY

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apwarnt

WARRANT: 18054 09/14/2017

FUND ORG	ACCOUNT	AMOUNT	AVLB BUDGET
		GRAND TOTAL	627,226.94

** END OF REPORT - Generated by Steve Walenski **

***Arlington School Committee
School Committee Regular Meeting
Thursday, September 14, 2017
6:30 PM***

*Arlington High School
School Committee Room
869 Mass Avenue, 6th Floor
Arlington, MA 02476*

Present: Jeff Thielman, Chair, Kirsi Allison-Ampe, Vice Chair, Bill Hayner, Secretary, Paul Schlichtman, Cindy Starks, Len Kardon, and Jennifer Susse

Kathleen Bodie, Ed.D. Superintendent of the Schools, Roderick MacNeal, Assistant Superintendent of the Schools, John Danizio, Chief Financial Officer, Rob Spiegel, Human Resource Director, Alison Elmer, Director of Special Education, Karen Fitzgerald, Administrative Assistant, Jason Levey, President of the AEA.

Mr. Schlichtman exited 8:34 pm and returned 8:35 pm

Open Meeting

Mr. Thielman welcomed everyone back to the 2017-2018 school year and welcomed all the new faces to the School Committee meeting and had everyone introduced themselves.

Opening Day Report

Dr. Bodie was happy to report a smooth opening to the new school year and provided a preview of tonight's meeting agenda items.

Public Participation

Ms. Gami Maislin, parent, spoke on behalf of Arlington parents seeking additional support for gifted and talented students, especially for those at the new Gibbs School. A handout was given to the committee members.

Summer Professional Development Update

Mr. MacNeal, Assistant Superintendent, explained the professional development for each of the departments in our school district which took place over the summer, many will continue on November 1 and December 12.

Due to parent's night tonight at the high school, we moved on to agenda item, AHS Building Project Website Launch and Update and will return to Summer PD update after

AHS Building Project Website Launch and Update

Amy Spears, parent and Dr. Allison-Ampe, School Committee member, and members of the AHS Building Communications Subcommittee provided an update on the project to create a communication strategy for the AHS Building Committee to engage the community of a two way street of communication to keep everyone informed of the complex building project ahead. Therefore a website was created and being launched this evening. website <http://ahsbuilding.org>

Summer Professional Development Update Continued

After the website presentation, the committee members asked Roderick questions if we are still using Tools of the Mind and Lucky Caulking programs and it was mentioned that we are and continues to be successful programs that the students are well prepared for moving forward.

The committee members heard that teachers continue to be trained in the Responsive Training Program and the administration team had received cultural competency professional development and will continue the training throughout the school year.

FY 17 End of the Year Budget Close Out

Mr. Danizio, Chief Financial Officer, wanted to say upfront that the FY 17 closed the year without a deficit. The first page of his report was a breakdown of calculations and the second page is a summary of the final spending for FY 17. John will provide Monthly Reports starting in October.

After Ms. Susse and Mr. Kardon asked a few questions about budget transfers, the final closeout numbers, payroll projections and the whole budget spending reports, Mr. Danizio announced he will be meeting with the Budget Subcommittee soon and will review and discuss a timeline of what will be included in the monthly reports to present to the full committee.

Facilities Update

Mr. Danizio provided a Facilities update on the busy summer building projects and provided a highlight on the maintenance projects at each of the schools. He said we welcomed a new Energy and Project manager, HVAC technician and three new custodians, and that we had a smooth opening and thanked Ms. Bennett and her departments for all their hard work.

School Committee Appointee to MSBA Designer Selection Panel for AHS Building Project

Dr. Bodie said that the School Committee must appoint a member of the School Committee to the MSBA Designer Selection Panel Committee for the AHS Building Project, which will read all the designer firms perspectives. Therefore, the following motion was made:

Dr. Allison-Ampe, MD, moved to nominate Mr. Jeff Thielman as the School Committee appointee to the MSBA Designer Selection Panel Committee for AHS Building Project, seconded by Jennifer Susse.

Voted: 7-0

Special Education CPR Findings

Ms. Elmer, Special Education Director presented the Coordinated Program Review Finds and requirements to correct each one. The 13 areas of non-compliance were found by DESE. Mr. Kardon then provided everyone with a report showing other town's findings and the committee members were concerned because the average was 4 findings. Since the committee members know teachers are all doing their best work for the students and that they are aware the number was higher a few years ago they asked Ms. Elmer if she needs them to do anything to help her, since they are concerned with the high number of non-compliances found. They noted the paperwork is not new or difficult but the non-compliances directly impact students and families

and doesn't seem clear to them what needs to happen to fix the problems. Ms. Elmer doesn't want to respond negatively but other factors can come into play such as staffing, training, regulations, software glitches as well as different DESE evaluators. Dr. Bodie did point out that we have spent time on training over the last few years, and professional development has improved and our goal is the same that we don't want these non-compliances but we are working on these issues and concur with Alison that it's the quality of services we are providing are excellent and we do the best for our students. The following motion was made:

Mr. Kardon moved to request the Superintendent to investigate the root causes for the high number of issues identified in the Coordinated Program Review and report back to the school committee in 90 days regarding the results of the investigation and any corrective measures to be undertaken and report back in December, seconded by Mr. Hayner.

Voted: 4-3, Mr. Kardon Yes, Ms. Susse Yes, Ms. Starks, No, Mr. Schlichtman No, Mr. Hayner Yes, Dr. Allison-Ampe Yes and Mr. Thielman No.

Motion passes

Appoint Kathleen Bodie, Ed.D. Superintendent of Schools as a voting member of the EDCO Collaborative Board

Dr. Bodie informed the committee that Per EDCO's Articles of Agreement, "Each Member District executing this Agreement shall annually appoint the Superintendent of Schools or one School Committee Member as a voting member of the Collaborative Board."

Mr. Hayner moved to appoint Kathleen Bodie, Ed.D. Superintendent of Schools as a voting member of the EDCO Collaborative Board, seconded by Mr. Schlichtman

Voted: 7-0

Superintendent's Report

Dr. Bodie provided an enrollment update and said we are up 180 students which is 3.3% increase. Kathy stated we had to hire more staff due to the significant increase of students and we will provide a Buffer Zone Report in October, and indicated the Official Enrollment numbers will come out in November.

A few concerns from the committee members were answered: The music room at the Hardy School is being used for an extra classroom, class sizes for elementary grades are at 24 or more, and all vocational school students will be verified by us and the Budget Subcommittee will review a report on enrollments for Chapter 70 money.

Hiring Report Update

Mr. Spiegel provided the Staffing Update as of September 14, 2017 and reported out on all the new administrators and the new teachers. The committee would like Kathy to arrange for the new leadership to come in over the next few meetings to be introduced.

School Building Projects Update

Stratton

Dr. Bodie said the furniture is coming in and would like to invite the community in to see the Stratton School in late October.

Thompson

It was mentioned the Thompson School should be completed by October 1 by the architects and would like to thank the teachers and administrators for their patience and will be moving into the new wing sometime during the school year.

Gibbs

It was noted a lot of debris has been removed from the building and everything is on schedule. A lot of work is going on with furniture and the planning during the summer on Gibbs School and the plan is to have a parent meeting and give a brief overview of transportation at some point too.

Hardy

We had to move back the finish time at Hardy since we will hire a contractor and designer at the same time in November and begin construction in March. The Hardy advisory is looking at the playground and Capital Planning is recommending \$120,000 to this plan.

High School

Once a designer is hired the high school design will go fast, and hope to have that done by end of October. The community forum on AHS would be in November and talk about transportation talk for all students not just the two mile mark and come with a solution for the town. Dr. Bodie said the Dir. of Transportation is looking at that along with GIS advisor Adam Kurowski.

Other updates were given on Technology, new Dashboard press release and the Unity Project.

Consent Agenda

Mr. Hayner moved to approve the Consent Agenda to Approval of Minutes: Regular School Committee Meeting Minutes of June 19, 2017

Approval of Warrant: Warrant 17209 Dated 6/22/17 Total Amount \$643,138.99

Warrant 17227 Dated 6/30/2017 Total Amount \$953,443.73

Warrant 18013 Dated 8/10/2017 Total Amount \$430,578.69

Warrant 18036 Dated 8/31/2017 Total Amount \$490,626.60, Approval of Trip: AHS Foreign Exchange Program, Florida April 16-21, 2018, seconded by Mr. Schlichtman

Voted: 7-0

Subcommittee & Liaison Reports & Announcements

Budget, Kirsi Allison-Ampe, MD. (Chair) the next meeting will be Tuesday, Sept 26 at 5:30 PM and will discuss the Budget Calendar, future Financial Reports, and timing and shaping of Budget books. Others topics: CPA Grant for the Hardy playground and should we fill out the application or not. After a discussion the following motion was made

Mr. Hayner moved to have the Kathleen Bodie, Superintendent fill out an application for the CPA Grant for the Hardy Playground, seconded by Dr. Allison-Ampe.

Voted: 7-0

Community Relations, Cindy Starks, (Chair) spoke about receiving 10 resumes and phone interviewing and will meet again September 19, 5 to 6 and will bring forward a recommendation for the AHRC position on September 28. The School Committee discussed SC Chat hours and dates, and it was determined to wait until January to meet and discuss if we need to modify Buffer Zones.

District Accountability, Curriculum/Instruction & Assessment, (CIAA) Paul Schlichtman, (Chair) nothing to report

Facilities, Jennifer Susse (Chair) nothing to report

Policies & Procedures, Len Kardon (Chair) spoke about meeting with MASC representative to discuss the Policy Manual. Mr. Schlichtman suggests that the subcommittee review and discuss Policy EE and coordinate with AHS Principal to coordinate conferences around School Committee Meetings and include this in the policy.

School Enrollment Task Force, Bill Hayner, Cindy Starks, Jennifer Susse nothing to report

Legal Services Review, Bill Hayner, Len Kardon nothing to report

Arlington High School Building Committee Jeff Thielman and Kirsi Allison-Ampe will meet Oct 3, at 6:00 pm, and the Designer Selection committee will meet next Wednesday.

*Gibbs Committee, Cindy Starks no update
Warrant Committee, Bill Hayner all paid*

*Liaisons Reports,
Ms. Susse met with Bishop School PTO.*

Announcements

Mr. Hayner reminded everyone tomorrow is Town Night and Town Day will be held on Saturday, September 16 and provided an invitation to everyone for the Rotary social November 14.

Future Agenda Items

The committee members would like to hear two other reports on ELL and Civil Rights.

Executive Session

Mr. Hayner moved to enter into Executive Session at 9:29 pm to conduct strategy sessions in preparation for negotiations with union and/or nonunion personnel or contract negotiations

with union and /or nonunion in which if held in an a open meeting may have a detrimental effect, and to conduct strategy with respect to collective bargaining or litigation, in which if held in an open meeting may have a detrimental effect, Collective bargaining may also be conducted, and discuss stipends: Principals, and vote to approve the following Executive Session Minutes: June 19, 2017 and to exit to adjourn, seconded by Mr. Schlichtman.

Roll Call: Unanimous

Voted: 7-0

Adjournment

Mr. Hayner moved to exit out of Executive Session and adjourn at 9:46 pm seconded Mr. Schlichtman.

Roll Call: Unanimous

Voted: 7-0

Correspondence Received:

Draft Minutes from June 19, 2017 Regular and Executive School Committee meeting

Legal Spreadsheet June 2017

Warrant 17209 6/22/2017

Warrant 17227 7/13/2017

Warrant 18013 8/10/17

Warrant 18036 8/31/17

August 7, 2017 email from Daniel Jalkut

Commissioner's Weekly Update July 14, 2017

Commissioner's Weekly Update August 8, 2017

August 16, 2017 email from Anissa Stern

MASC Bulletin June 2017

International Travel Application Mary Villano Florida April 16, 2018

Building summer projects memo J. Danizio

FY 17 Budget Close out draft J. Danizio

Staffing 2017 Update Report R. Spiegel

Special Education CPR Findings Presentation A. Elmer

AHS Bldg Website

Summer 17 PD Highlights R. MacNeal

Respectfully submitted

Karen Fitzgerald

Arlington School Committee

Administrative Assistant



Town of Arlington, Massachusetts

8:45 PM Vote Delegate and Resolutions for MASC Annual Business Meeting

Summary:

- Vote Delegate and Resolutions for the MASC Annual Business Meeting held during the Joint Conference on Wednesday, November 1, 2017, 3:15 pm

ATTACHMENTS:

	Type	File Name	Description
▢	Document for Approval	MASC_ANNUAL_BUSINESS_MTG.pdf	MASC Delegate and Resolution for MASC Conference



Massachusetts Association of School Committees, Inc.

One McKinley Square, Boston, Massachusetts 02109
(617) 523-8454 (800) 392-6023 fax: (617) 742-4125 www.masc.org

R. Patrick Murphy, President
Glenn Koocher, Executive Director

March 10, 2017

TO: School Committee Members

SUBJECT: **MASC ANNUAL BUSINESS MEETING**

Will be held during the Joint Conference on Wednesday, November 1, 2017, 3:15pm.

RESORT and CONFERENCE CENTER at HYANNIS

Voting Delegate
Resolutions

Enclosed is the Official Delegate Form for registering your voting delegate for the MASC annual business meeting. This year's meeting will be in Hyannis during the joint conference. The form must be received in the MASC office by Friday, October 20, 2017.

MASC adopts its formal positions from decisions made by our membership. The resolution process is the primary vehicle for measuring feedback and developing legislative positions and action. Enclosed is the form, and instructions for submitting a resolution for consideration at the annual meeting. The deadline for submission of resolutions for review by the Resolutions Committee is July 1, 2017.



Massachusetts Association of School Committees, Inc.

One McKinley Square, Boston, Massachusetts 02109

(617) 523-8454 (800) 392-6023 fax: (617) 742-4125 www.masc.org

R. Patrick Murphy, President

Date: March 2017

To: MASC member school committees, c/o superintendent of schools

Re: Voting delegate to annual business meeting

Date: **DURING JOINT CONFERENCE. WEDNESDAY NOVEMBER 1, 3:15PM**

Location: **RESORT AND CONFERENCE CENTER AT HYANNIS, HYANNIS**

FIRST NOTICE

In order for your school committee to have a vote at the annual business meeting of the Massachusetts Association of School Committees, it is necessary that an official delegate be designated in pursuance of Article IX, Sec. 6 of the By-Laws, as follows:

All members of the Association, and all members of school committees which are active members of the Association, may attend and speak at any meeting of the Association. Only active members shall be entitled to vote on the election of officers or on any other matter as to which members of the Association shall have the right to vote and each active member shall have one vote. No later than seven days prior to each meeting of the Association each active member shall, by written notice to the Executive Director, designate one of its members as its voting delegate and may by such notice designate one of its members as its alternate voting delegate. All ballots and other votes cast by an active member at any meeting of the Association shall be cast by and only by its voting delegate or if the delegate be absent, by its alternate voting delegate if one shall have been designated.

PLEASE NOTE:

- An official delegate is only that delegate whose school committee has complied with annual dues regulations as spelled out in Article IV of the MASC By-Laws.
- Deadline for receipt of delegate forms by the Executive Director for the 2017 annual meeting is October 20, 2017.

Official Delegate Form

For the school committee of _____

The official voting delegate is: _____

The alternate voting delegate is: _____

Signed _____

NOTE: In order to register for the annual business meeting, delegates must send in this form in addition to the conference registration form.

report of the resolutions committee

The MASC Resolutions Committee met on July 5, 2017 to consider the resolutions proposed by member districts for consideration at the 2017 Annual Meeting of the Association. Members present: Beverly Hugo, Framingham (Chair, Ex Officio), Patrick Francomano, Past President and King Philip Regional School Committee, William Fonseca, East Longmeadow School Committee; Margaret Driscoll, Melrose School Committee; Laura Fallon, Northampton School Committee, Irene Feliciano-Simms, Holyoke School Committee; Mildred Lefebvre, Holyoke School Committee; Geoff Swett, Wareham School Committee; Brian O'Connell, Worcester School Committee; Brendan Walsh, Salem School Committee

The following resolutions were moved forward by the Resolutions Committee and approved by the MASC Board of Directors at their meeting on July 12.

RESOLUTION 1: MOVEMENT OF THE CHAPTER 70 FUNDING ENROLLMENT DATE TO MARCH 15

Submitted by the Framingham School Committee

WHEREAS: District schools in Massachusetts Department of Education report peak enrollment in the months of January, February and March.

WHEREAS: House Bill 2846 would provide that a district may only receive reimbursement from the proposed Unfunded Student Reserve Fund if the district has a net enrollment of more than 100 new students between October 1 of the previous year and March 1 of the current year.

WHEREAS: Many districts must have their budgets completed prior to knowing what their Chapter 70 funds amount will be.

THEREFORE BE IT RESOLVED that: The Massachusetts Association of School Committees file for and support legislation that will implement the movement of the Chapter 70 funding enrollment date to March 15th.

RATIONALE: Giving the districts the ability to base their budget on the enrollment rate after the peak enrollment time will allow districts to base their budget with increased accuracy to meet the needs of their student population. Underfunding leaves students at risk to fall behind due to not having the appropriate staffing, technology or needed educational materials. Smaller districts will be more at risk as their admission rate may not reach the required 100 students proposed in House Bill 2846 (2017) and will be least able to absorb the additional cost of unfunded students. For larger districts the proposed Unfunded Student Reserve Fund will still leave them underfunded as the amount proposed to be set aside will not meet the needs of the students across the state.

RESOLUTION 2: REFORM OF CIRCUIT BREAKER FUNDING

Submitted by the Framingham School Committee

WHEREAS: The Special Education Circuit Breaker program includes a provision that only allows districts to claim for extraordinary relief when claimable special education costs exceed 125% of the year's claimed costs.

WHEREAS: There are many districts that have a large special education population especially with regard to out-of-district placements that will never reach the special provision of 125%. Framingham alone has budgeted over \$42 million for district SPED costs.

WHEREAS: Out-of-district placement costs are rising yet the out-of-district schools have not been liable for their expenditures to the taxpayers, and there is no accountability for the increases. Public schools are held accountable to the taxpayers for where every dime goes. In turn districts are unable to justify their rising expenditures and are unable to receive the additional funding needed from those to whom they are accountable.

WHEREAS: Medicare and Medicaid cuts that are being discussed threaten many districts who have their Physical Therapy, Occupational Therapy and Speech Therapy services paid for by those programs to bear the burden of these costs.

THEREFORE BE IT RESOLVED that: The Massachusetts Association of School Committees file for and support legislation that will support the provision of reform for Circuit Breaker Funding and support the recommendations of the Foundation Budget Review Commission.

RATIONAL: According to MAAPS 2012 Bottom Line Report between 2006 and 2012, special education costs in Massachusetts increased by 56% compared to 36% for all public education.

RESOLUTION 3: LITIGATION FOR FAIR SCHOOL FINANCE

Submitted by the Framingham School Committee

WHEREAS: As the result of a lawsuit (*McDuffy vs. Driscoll*), the MA Supreme Judicial Court ruled that the Commonwealth was obliged to provide such financial assistance so as to assure that there would be an adequate level of support for the public schools, and

WHEREAS: Public schools rely heavily on state financial assistance to underwrite the legislatively mandated level of "required net school funding" that meets the current standard of "adequacy" envisioned by the Supreme Judicial Court, and

WHEREAS: Based on the findings of the Foundation Budget Review Commission and the consensus of public educators across Massachusetts, state financial assistance to support a standard of adequacy sufficient to meet the Massachusetts Constitutional standard as determined in the *McDuffy* case, is lacking and

WHEREAS: The second attempt at litigation to secure greater state financial support was rejected by the SJC, but did not rule out a willingness to hear a future case should the situation merit consideration,

THEREFORE BE IT RESOLVED that: The members of the Massachusetts Association of School Committees, through its delegate assembly, authorizes the Board of Directors to:

1. Reassess the need for a new round of litigation to secure funding to guarantee an adequate appropriation of funds, and
2. Assess the viability of a lawsuit to secure such funding, and
3. Join with other parties at interest to plan and file such a lawsuit if it is determined that there is likelihood of success, and
4. That the Board of Directors shall be authorized to use the reserves of the Association to help underwrite the cost of such litigation.

RESOLUTION 4: PRIVATIZATION OF PUBLIC EDUCATION AND THE OVERSIGHT OF PUBLIC SCHOOLS, INCLUDING SMALL AND REGIONAL DISTRICTS

Submitted by the MASC Board of Directors

WHEREAS: The voters of Massachusetts overwhelmingly rejected a ballot initiative to lift the cap on charter school expansion, and

WHEREAS: In light of the decision of the voters, advocates for further reforms have proposed several new strategies that include such concepts as introducing federal tax credits for families who enroll their children in private schools, authorizing vouchers for use in private schools, and creating additional regulatory options to expand the power of the state to alter the status of schools and districts so as to limit the authority of the residents of their communities to oversee their public schools,

THEREFORE BE IT RESOLVED that: The Massachusetts Association of School Committees, recognizing the provisions of the state constitution, oppose any state or federal legislative initiative to authorize the use of state funds for education to subsidize the tuition or costs of private schools, except where specifically authorized for students in special education programs, or students with disabilities.

Further, MASC opposes any state legislative initiative that expands the authority of the Commissioner of Education, the Board of Elementary Education, or the Secretary of Education over schools and school districts beyond those already imposed, and that MASC further opposes the alteration or conversion of any school or district status

beyond that permitted by current law without the consent of the city, town or region in which the school or district is located.

MASC supports the protection of small and rural school districts from modifications in their governance format and regional structure without the consent of the member communities, and, further, supports recognizing the special financial requirements of these, often geographically large and difficult to access parts of the state.

RESOLUTION 5: USE OF FEDERAL FUNDS

Submitted by the MASC Board of Directors

WHEREAS: School districts are operating in difficult economic conditions as the cost of education exceeds normal inflationary growth in our economy, and

WHEREAS: The Commonwealth has provided some measure of relief, but the growth in Chapter 70 funding has failed to keep up with expanding costs, and

WHEREAS: Several federal grant programs allow the Commonwealth in general, and the Department of Elementary and Secondary Education, in particular, to take an administrative overhead allowance from government aid programs including the Elementary and Secondary Education Act, the Perkins Vocational Technical Education Act, and certain programs under the Department of Agriculture, and

WHEREAS: This money allocated for maintaining the state bureaucracy would be better deployed at the school and district level,

THEREFORE BE IT RESOLVED that: MASC urges the legislature to restrict the ability of the Commissioner, Secretary of Education or Board of Elementary Education to take for its own purposes or use by the Department of Elementary and Secondary Education, such as but not limited to administrative overhead of the state agency, any share of funds disbursed by the federal government under ESSA, the Perkins Vocational Technical Education Act, or programs under the oversight of the U.S. Department of Agriculture, and, further, that those funds be directed specifically to schools and school districts.

RESOLUTION 6: FOUNDATION BUDGET

Initiated by the Worcester School Committee

Sponsored by the MASC Board of Directors

WHEREAS: A special Foundation Budget Review Commission (FBRC) reported its recommendations in 2015 to the General Court and to the public, and

WHEREAS: Among the recommendations were those to calculate more accurately the costs of students in special education and health insurance costs for employees and retirees, and

WHEREAS: Several recommendations of the members of the Commission to establish adequate and equitable funding for school districts remain unresolved, and

WHEREAS: There remains a broad consensus that the overall calculations used to establish the "Foundation Budget" for city, town and regional school districts remain significantly understated and, in the opinion of MASC and its members, violates the letter and spirit of the ruling of the Massachusetts Supreme Judicial Court in the 1993 *McDuffy* case,

THEREFORE, BE IT RESOLVED that: MASC calls upon the legislature to enact the recommendations of the Foundation Budget into law, and further,

- That the legislature order the Commission to reconvene in order to conduct further deliberations and make such recommendations as the FBRC may propose, and further
- That the FBRC shall address and make recommendations toward the overall accuracy of the adequacy of the overall Foundation Budget.

RESOLUTION 7: AFFORDABLE CARE ACT AND MEDICAID

Submitted by the MASC Board of Directors

WHEREAS: The Affordable Care Act expanded access for health care to millions of Americans, including thousands of Massachusetts families who have been without health insurance, and

WHEREAS: Through the expansion of the Medicaid program, more families in economic distress gained access to health insurance and, subsequently, affordable health care, and

WHEREAS: The Medicaid program reimburses public school districts for certain clinical services provided to students who may be clients of special education or who experience disabilities, and this revenue provides critical support to the districts and municipalities where they are based, and

WHEREAS: The restriction of Medicaid eligibility and reduction of funding would require the Commonwealth to choose between extraordinary state budget increases to fill the gap or absorb the cost of caring for families that could lose health insurance,

THEREFORE BE IT RESOLVED that: MASC urges the Congress to preserve the Affordable Care Act and its expansion of Medicaid programs for the states, and further

- MASC urges the General Court to require that 100% of Medicaid reimbursements to cities and towns be provided in full amount to the public schools of each municipality to underwrite the cost of providing an adequate education.



Town of Arlington, Massachusetts

8:50 PM Subcommittee & Liaison Reports & Announcements

Summary:

- *Budget, Kirsii Allison-Ampe, MD. (Chair)*
- *Community Relations, Cindy Starks, (Chair)*
- *School Committee Chat Schedule*
- *District Accountability, Curriculum/Instruction & Assessment, (CIAA) Paul Schlichtman, (Chair)*
- *Facilities, Jennifer Susse (Chair)*
- *Policies & Procedures, Len Kardon (Chair)*
- *School Enrollment Task Force, Bill Hayner, Cindy Starks, Jennifer Susse*
- *Legal Services Review, Bill Hayner, Len Kardon*
- *Arlington High School Building Committee Jeff Thielman and Kirsii Allison-Ampe*
- *Gibbs Committee, Cindy Starks*
- *Warrant Committee, Bill Hayner*
- *Liaisons Reports*
- *Announcements*
- *Future Agenda Items*

ATTACHMENTS:

Type	File Name	Description
Document for Approval	School_Committee_Office_Hours_2017-2018_(1).docx	School Committee Chat Schedule

School Committee Office Hours

First Saturday of the month from 11-12am

Date	Person 1	Person 2	WHERE
10/7	Paul Schlichtman	Jennifer Susse	Café Nero
11/4	Cindy Starks	Kirsi Allison-Ampe	Whole Foods
12/2	Cindy Starks	Jeff Thielman	Café Nero
1/6	Cindy Starks	Jennifer Susse	Whole Foods
2/3	Paul Schlichtman	Len Kardon	Café Nero
3/3	Jeff Thielman	Bill Hayner	Whole Foods
4/7	Kirsi Allison-Ampe	Len Kardon	Café Nero
5/5	Jennifer Susse	Bill Hayner	Whole Foods
6/2	Len Kardon	Bill Hayner	Café Nero



Town of Arlington, Massachusetts

Executive Session

Summary:

- *To conduct strategy sessions in preparation for negotiations with union and/or nonunion personnel or contract negotiations with union and /or nonunion in which if held in an a open meeting may have a detrimental effect.*
- *To conduct strategy with respect to collective bargaining or litigation, in which if held in an open meeting may have a detrimental effect, Collective bargaining may also be conducted.*



Town of Arlington, Massachusetts

9:00 PM Adjournment



Town of Arlington, Massachusetts

Correspondence Received:

Summary:

MASC Annual Business Meeting Form and Resolutions

Draft minutes from School Committee Regular and Executive Session meeting 9/14/2017.

Warrant # 18054 dated 9/14/2017

Facilities Presentation, R. Bennett

EDCO Board of Directors letter, September 15, 2017

The NY Times The Economic Case for Letting Teenagers Sleep a Little Later, J. Susse

YRBS Highlights Report and 2017 Youth Risk Survey

Behavior Survey Report September 2017 and presentation

Email Correspondence Received by K. Roche

Community Relations Minutes approved minutes 8/30/2017

Email correspondence K. Nickerson

Resume of AHRC Candidate, D. Maxwell

CBI Evaluation of the Superintendent Policy

Superintendent Evaluation Process Timeline

School Committee chat schedule

AHS Presentation PISA